FEBRUARY 2009 VOL17 NO2

NSC

NEW STEEL CONSTRUCTION

www.new-steel-construction.com

Transport museum on track
Offices arrive at Victoria
Liverpool gets handle on Academy
Olympic pool in Corby

The highest levels of productivity and production cost savings available...

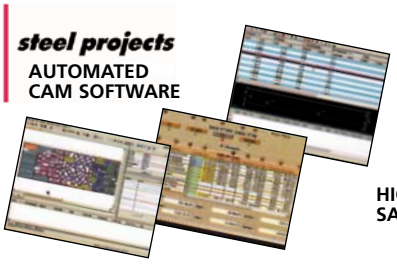
...and ask about the latest cost-effective **part exchange** and **leasing deals** on offer

FICEP has over 100 automated steel processing machines in its team lineup that can be used as highly efficient stand-alone performers or integrated into a complete, software controlled production line using state-of-the-art CAM software. The productivity increases and reductions in production costs that are achievable set new performance benchmarks within the structural steel and fabrication industry.

Many of these advanced CNC machines now also incorporate FICEP's unique patented*, scribing system, a feature which offers further substantial savings in time and labour costs. This proven fully automated system interfaces directly with CAD systems without operator input and is being used successfully in both large and small structural steel fabricators to maximise competiveness and productivity.

* Patent pending

steel projects
AUTOMATED CAM SOFTWARE



HIGH SPEED DRILLING, SAWING & SCRIBING

DRILLING, PUNCHING, THERMAL CUTTING, MILLING & SCRIBING

ADVANCED CNC PRESS BRAKES

SHOT BLASTING

PERMANENT MAGNETIC LIFTING SYSTEM FOR PLATES, BARS & BEAMS

PLASMA & GAS CUTTING

FICEP UK LTD

PIPE CUTTING

FICEP UK Ltd., 10 The Courtyards, Victoria Park, Victoria Road, Leeds LS14 2LB. Sales Tel: **+44 (0) 113 265 3921** Fax: **+44 (0) 113 265 3913**
E-mail: **info@ficep.co.uk** **www.ficep.co.uk**

CONTENTS

FEBRUARY 2009 VOL17 NO2

These and other steelwork articles can be downloaded from the New Steel Construction website at www.new-steel-construction.com

5 **Editor's comment** Growth sectors may be few at present but steel is well represented in two - education and healthcare writes Nick Barrett.

6 **News** The 2008 Market Shares Survey shows steel's total market share remains above 70% in what was a record year for multi storey building frames.

11 **Eurocode implementation** The countdown.

12 As part of the town's regeneration programme, **Corby** is building one of the UK's few Olympic-sized 50m swimming pools.

14 Steel construction came to the fore at **East Kilbride's Playsport project**, one of the UK's largest public sports centres.

16 A Jaguar car door handle was the inspiration behind the design for the new **North Liverpool Academy**.

18 An architectural masterpiece is taking shape on the banks of the River Clyde to house **Glasgow's historic transport** collection.

22 The last in NSC's **Supply Chain** series examines the role of steelwork fabrication machinery manufacturers.

24 An impressive D-shaped commercial development is under construction on a prestigious site opposite **London's Victoria Station**.

28 John Dowling of Corus explains BS 9999, a recently published code of practice for **fire safety** in the design, management and use of buildings.

30 SCI members have completed a **survey** on the steel sector's preparations for the Eurocodes.

32 **40 Years Ago** Our look back through the pages of Building with Steel features a multi storey office building in the USA.

34 **Advisory Desk** The latest advice from SCI - AD 330 - examines open top box girders for bridges.

34 **Codes and Standards**

35 **Publications**

36 **BCSA members**

38 **SCI members**

Cover Image
Riverside Museum, Glasgow
Client: Glasgow City Council Cultural Leisure Services
Architect: Zaha Hadid Associates
Steelwork contractor: Watson Steel Structures
Steel tonnage: 2,525t

The ANGLE RING Co Ltd

Tel: 0121 557 7241 Fax: 0121 522 4555
Email: sales@anglering.com
Web: www.anglering.com

- press**braking**
- section**bending**
- induction**bending**
- spiral**bending**
- pipe**forming**
- plate**rolling**

Quality Counts...

and has done since 1951...
Angle Ring, for ALL your bending needs...

NSC NEW STEEL CONSTRUCTION
www.new-steel-construction.com

EDITOR
Nick Barrett Tel: 01323 422483
nick@new-steel-construction.com
DEPUTY EDITOR
Martin Cooper Tel: 01892 538191
martin@new-steel-construction.com
CONTRIBUTING EDITOR
Ty Byrd Tel: 01892 524455
ty@barrett-byrd.com
PRODUCTION EDITOR
Andrew Pilcher Tel: 01892 524481
andrew@new-steel-construction.com
PRODUCTION ASSISTANT
Alastair Lloyd Tel: 01892 524536
alastair@barrett-byrd.com
NEWS REPORTERS
Mike Walter, Victoria Millins
ADVERTISING SALES MANAGER
Sally Devine Tel: 01474 833871
sally@new-steel-construction.com

PUBLISHED BY
The British Constructional Steelwork Association Ltd
4 Whitehall Court, Westminster, London SW1A 2ES
Telephone 020 7839 8566 **Fax** 020 7976 1634
Website www.steelconstruction.org
Email postroom@steelconstruction.org

The Steel Construction Institute
Silwood Park, Ascot, Berkshire SL5 7QN
Telephone 01344 636525 **Fax** 01344 636570
Website www.steel-sci.org
Email reception@steel-sci.com

Corus Construction and Industrial
PO Box 1, Brigg Road, Scunthorpe, North Lincolnshire DN16 1BP
Telephone 01724 404040 **Fax** 01724 404224
Website www.corusconstruction.com
Email construction@corusgroup.com

CONTRACT PUBLISHER & ADVERTISING SALES
Barrett, Byrd Associates
Linden House, Linden Close,
Tunbridge Wells, Kent TN4 8HH
Tel: 01892 524455
www.barrett-byrd.com

CHANGES TO THE MAILING LIST
If you wish to notify us of a change:
Non Members Non Members of either the SCI or the BCSA please telephone Corus on 01709 825452
Members BCSA Telephone BCSA on 020 7839 8566
Members SCI Telephone SCI on 01344 636525

corus BCSA The British Constructional Steelwork Association Ltd SCI

Steel still dominates growth sectors

Fewer construction projects will be undertaken this year as recession bites, but it is hard to see any reason to expect steel to be selected for a smaller proportion of them than has now become usual. As we see from the latest Market Shares Survey from independent researchers Construction Markets (see News page 6), steel still enjoys a dominant share of the key multi storey buildings market and its dominance in single storey industrial buildings is overwhelming.

Growth sectors will be few and far between this year, and perhaps next as well, but steel is well represented in two of the most important ones, education and healthcare. Steel is about as popular with clients and designers in those two growth areas as it is in the multi storey sector – which is to say it is the framing solution of first choice.

Steel construction is a 20 year growth success story without parallel and the reasons why are evident from any issue of NSC. This month's issue carries a report from another education sector project, the North Liverpool Academy, which shows the steel solution delivering sound value, as expected. As well as achieving a cost effective solution for the academy overall, steel's flexibility was able to turn what might have been a workaday entrance into a focal point whose design is intended to inspire generations of students. The complicated design was taken in their stride by the construction team using steel.

Similar stories are repeated on other pages. Glasgow's iconic new transport museum could hardly have taken the shape it is doing, certainly not in the time it is taking, if it was framed in anything other than steel. Also in Scotland, the country's most advanced public sports facility has been erected on a difficult site with a minimum of fuss.

In the old steel town of Corby a steel framed Olympic sized swimming pool, one of only a few in the UK, to be used as a training pool for the 2012 London Olympics, is fittingly playing a part in putting a regenerating town on the map. Cellular beams will be left exposed for aesthetic reasons in a design that the client calls 'first class'.

Our Supply Chain series concludes this month with a look at the contribution made by equipment manufacturers to the steel success story. Investment in these productivity and quality enhancing state of the art machines has been one of the keys to the productivity gains that have been shared by the steel sector with its clients.

No issue of NSC would be complete without a modern office building showing steel to its best advantage, delivering a cost effective, sustainable, quality solution on time and to budget. This one, Abford House, could hardly be on a more high profile site, right outside London's Victoria Station where thousands of people witness its rapid progress every day. With this sort of track record we can confidently expect next year's Market Shares Survey to continue the steel success trend.

Nick Barrett - Editor

Steel leads the market for frames

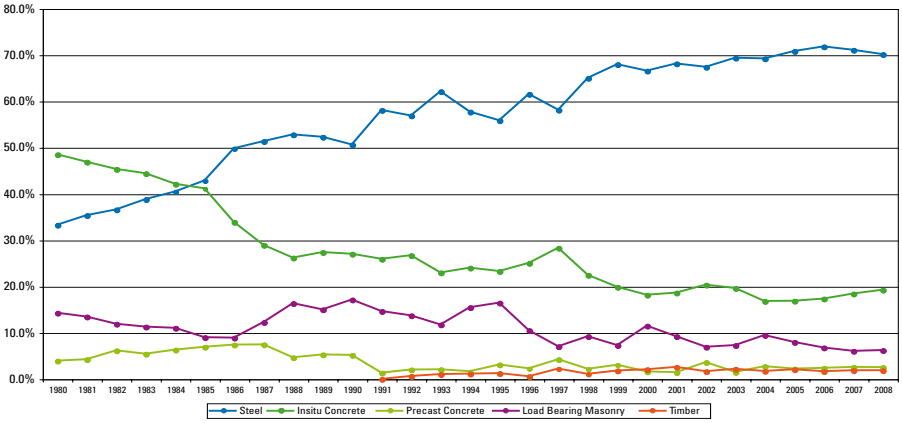
Steel has been confirmed as the structural framing solution of first choice of the overwhelming majority of the UK design community in the latest Market Shares Survey. The 2008 survey, by independent market researchers Construction Markets, shows that steel's market share remained above 70% in what was a record year for multi storey building frames.

Steel enjoyed a 70.1% share of the overall market of 15.3M square metres for multi storey building frames. Dominant market share was also retained in the key growth sectors of education and healthcare. Steel's share of the single storey building market remained high at 97%.

Corus Construction Services and Development General Manager Alan Todd said: "This is the 28th in this series of surveys which tell us all we need to know about the market response to steel's quality and economic solutions. Despite the need for price rises being forced on steel manufacturers worldwide in recent years steel has maintained its competitive position.

"Rival materials have also faced intense price pressures so the relative competitive situation is little changed. When developers and their construction teams factor in the many advantages of steel such as superior sustainability and more certainty with construction programmes, the case for steel is obviously overwhelming. "

Mr Todd added that although a challenging year lay ahead for the construction industry Corus remained committed to continuing its long term investment in research and development, and to making available to designers all they need to make designing in structural steel as straightforward as possible. "We are determined to continue investing so that steel construction can be even more popular with designers and building developers coming out of this recession than it was going into it."



The Market for Structures – Non-Residential Multi-Storey Buildings – Total

Sustainability key to supermarket project

One of the largest ever pre-let distribution centres in the South East is currently under construction near Sittingbourne, Kent.

Known as G. Park Sittingbourne, the project is located close to the M2 motorway and consists of approximately 85,000m^2 of warehousing and distribution space, split across two units, for supermarket chain Morrisons

Atlas Ward Structures, which was responsible for all steelwork design and fabrication, has erected more than 2,700t of steelwork for the project.

Sustainability is playing a key role in the development of the site and although early enabling works included a large earthmoving and cut and fill operation, no excavated material left the site.

All overburden was used to create new wildlife ponds and grassland areas to replace drained areas of the site.

A number of cutting edge sustainable features are being incorporated into the project such as kinetic plates on estate roads, which will generate power from vehicles passing over them. Other ecological measures include rainwater harvesting and recycling as well as energy efficient lighting.

Iconic office block for steel city's gateway

A new pre-let eight-storey commercial development is taking shape on Sheffield's Parkway. Approximately 400t of structural steelwork will be erected by Hambleton Steel for the project which is located at the city's recognised gateway.

Jonathan Palmer, Structural Engineer for Capita Symonds Structures, says the project features some impressive architectural elements such as a 40m-high inclined external CHS braced rear elevation and horizontally plained A-frames at two intermediate levels.

Other notable features include an impressive overhanging disk shaped canopy which will form a high level tied flag pole.

Taking inspiration from designs adopted in locations such as Dubai, the rear of the structure has shallow overhangs extending 6m from support and these will be formed with heavy columns in a fan arrangement.

CE Marking edition of NSSS updated

To help specifiers fully understand the forthcoming CE Marking standard for structural steelwork, the BCSA and SCI are updating the National Structural Steelwork Specification (NSSS).

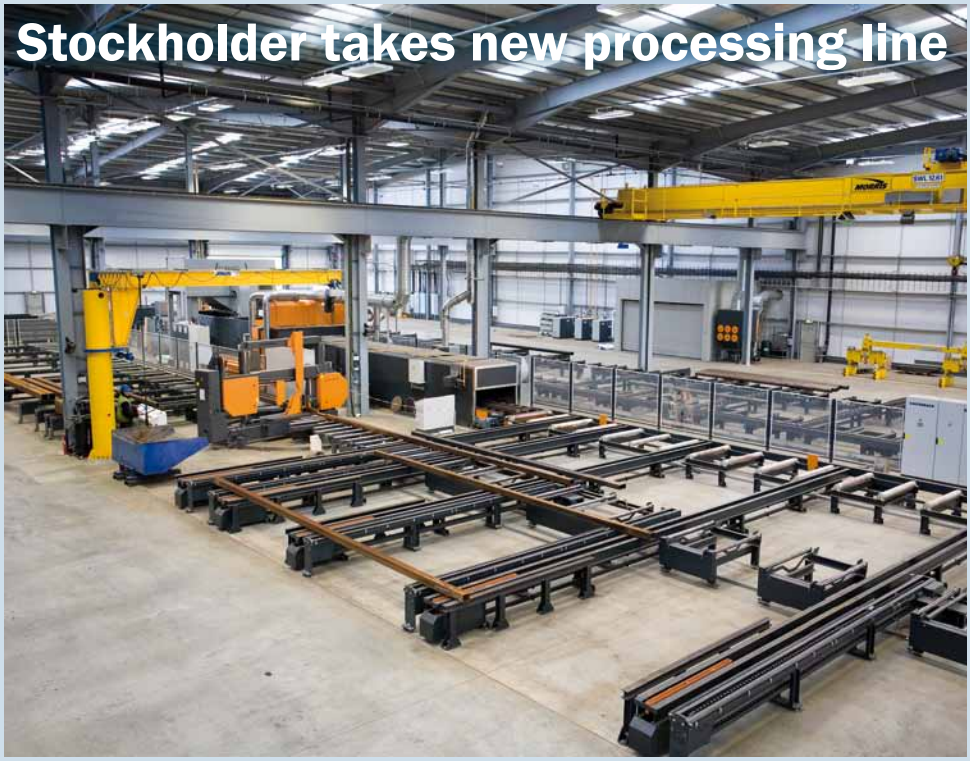
The updated edition will take into account the requirements given in BS EN 1090-2 and the forthcoming CE Marking standard for fabricated steelwork, BS EN 1090-1.

The European standard for the fabrication and erection of steel and aluminium structures (BS EN 1090-2: 2008 'Erection of steel structures and aluminium structures Part 2: Technical requirements for the execution of steel structures) was published by the BSI last December.

BS EN 1090-2 will supersede several existing standards, such as BS 5950-2 (Buildings), BS 5400-6 (Bridges) and part of BS 8100 (Towers and Masts). It has a wide scope of application and requires specifiers to make a series of project or application specific decisions before execution can commence.

It is anticipated that the new NSSS will available in May 2009.

Stockholder takes new processing line



A new state of the art Kaltenbach structural steel processing line has been installed at Rainham Steel's main distribution facility in Scunthorpe.

The line includes a 100m long central conveying system that passes material through the latest Gietart Sprint 1.6 shotblast and automated paint system, which in turn sits between two parallel bandsawing lines, each with a Kaltenbach KBS1301 DG, CNC saw.

The saw lines are interlinked to a heavy-duty KDX 1215, three axis, five tool per spindle, NC drill. Material exiting the paint drying tunnel can be automatically transferred by cross ways onto either of the bandsawing systems and if required, onward to the drill.

"Our process line is the latest phase of our expansion and gives us a formidable added capability and speed of response," said John Green, Works Manager at the Scunthorpe site.

Rail crossing on track

Allerton Bridges' new Durham factory has succesfully completed its first project, the Marske Mill Lane Overbridge in Saltburn.

The 23m long x 8m wide structure replaces a Victorian railway crossing and has increased the bridge's weight carrying limit from 4t to 40t.

Allerton Bridges completed the 45t steel construction at its fabrication shop in Tursdale, near Belmont, Durham, in four weeks. The £140,000 contract, commissioned by Network Rail, is the first to be produced by the team following the opening of the facility in October 2008.

John Riddle, Managing Director of Allerton Bridges, said: "The bridge side of the market is very buoyant at the moment and this is just the first of a number of orders we have in place over the coming months."

AROUND THE PRESS

Contract Journal
14 January 2009
Sustainability in great store
Referring to the Blue Planet warehouse at Chatterley Valley, McLaren Construction Site Manager Peter Goodman, says: "We looked at green roofs and Glulam frames but they couldn't be purchased in the size we needed so it was decided steel was the best solution because it is recyclable and has a 100-year lifespan."

Construction News
27 November 2008
Looking to make a very quick fix
The steel structure modules are like an aquarium frame as they are very light and consist simply of beams at roof and floor level linked by just four columns in each of the two modules.

New Civil Engineer
11-18 December 2008
Keeping it simple
The steel truss roof of the 2012 Handball arena is the art of simplicity - standard purlin, with short spans. "We are keeping the spans as short as possible to keep down the cost of the roof structure and the cost of the building," says Arup Associate Director Andy Pye.

Construction News
22 January 2009
Hunting down the defining discovery in construction
From the point of view of a steelwork engineer, the development of the plastic theory of design has revolutionised the way we design. It focuses on the specific strength qualities of steel to bring about economy.

Building Magazine
23 January 2009
Plane geometry
(Referring to Cranfield University) But the real eye-catcher here is the assemblage of open steel trusses holding up the roof directly above it - an intricate 3D web of solid beams, open web beams and slender ties.

Construction Products Regulations due this year

The European Commission is proposing to replace the Construction Products Directive with the Construction Products Regulations.

The aim is to remove all remaining regulatory and technical obstacles to the free trade of construction products in the European Union and simplify the CE Marking process.

It is expected to be approved this year and if accepted they will come in to force in July 2011.

Dr David Moore, BCSA Director of Engineering, said: "The main difference between the current directive and the proposed regulations, is that the regulations will be mandatory in all EU member states."

Currently CE Marking of construction products in the UK and the Republic of Ireland is voluntary, but this will become mandatory once the regulations are in place.

The relevant European harmonised standard for CE Marking fabricated steelwork is EN 1090-1 Execution of steel structures and aluminium structures - Part 1 Requirements for conformity assessment of structural components.

A copy of the proposal is available on the Europa website at *http://ec.europa.eu/enterprise/construction/index_en.htm*

Yorkshire gets new steel framed college

Steelwork has been completed on the new Keighley College project in West Yorkshire. More than 1,200t of structural steelwork has been erected on site by Elland Steel Structures, on what is regarded as the largest construction job in the town for 20 years.

Bob Thorpe, Chief Executive for Elland Steel, said: "We erected a beam and column structure consisting of upper ground floor, first, second and third floors, lower roof and main roof with parapets, a mezzanine floor, a curved facade and an entrance lobby."

Conveniently located next to the town's railway station the new Park Lane College Keighley will replace two existing educational sites nearby.

Makeover for fire test centre

Leighs Paints has completed the first phase of a multi-million pound redevelopment plan to its onsite FIRETEX fire test centre.

The initial £500,000 investment to replace the stack and associated filtration system, will allow an increased number of new product development tests to be performed each day.

During the test, Leighs Paints fire protective coatings range, known as FIRETEX, are tested to extreme temperatures in two onsite furnaces. The tests play a vital role in ensuring the coatings protect steel structures from collapse in the event of a fire.

Andy Taylor, Head of Science at Leighs Paints, said: "This is the first phase of an exciting redevelopment plan of our fire test facilities. It will help Leighs Paints' technical team in their ongoing quest to develop safer and more efficient coatings."

Olympic site reaches half way point

Work on the London 2012 Olympic Park is progressing on schedule and during January the project celebrated reaching the half way point between winning the bid to host the Games and the Opening Ceremony on 27 July 2012.

Olympic Delivery Authority Chairman John Armitt said: "Half way to 2012 we are right on track. We are making good progress but we are not complacent, there is still a big challenge ahead."

Construction of the Olympic Stadium and the Aquatics Centre started last year, ahead of schedule, and work is now also underway on the Olympic Village and infrastructure such as energy networks, roads and bridges.

Steel rakers being erected by Watson Steel Structures are now visible as the upper tiers of the Stadium (left) are being formed.

Thousands of job opportunities are being created this year for various construction professions, as well as administrative and support staff. The workforce on the Olympic Park and Village is expected to peak at around 11,000 in 2010, with a total of around 30,000 workers expected to be employed up to 2012.

Corus lends support to sustainability exhibition

Corus will be an official supporter of the UK Green Building Council (UKGBC) stand at the Ecobuild and Futurebuild 2009 exhibition which takes place at London's Earls Court from 3-5 March.

Ecobuild is the world's largest sustainable construction exhibition, and the UKGBC has been a headline supporter of the expo since its inception. Part of the stand will display the Corus sustainability story, while Corus representatives will also be on hand to discuss UKGBC and steel industry issues.

The UKGBC was launched in 2007 to bring clarity, purpose and coordination of sustainability to the sector. Its mission is to dramatically improve the sustainability of the built environment by radically transforming the way it is planned, designed, constructed, maintained and operated.

As well as 800 exhibitors, Ecobuild will have over 100 practical and applied seminars, and more than a dozen interactive attractions. There will also be a conference held over the three days, which this year hosts the inaugural conference of the UKGBC.

Chief Secretary to the Treasury, Rt Hon Yvette Cooper MP, will address the crowds at Ecobuild in a keynote speech on the first morning of the event.

For more information and to register for the exhibition visit: *www.ecobuild.co.uk*

Working week campaign launched

The BCSA is running a campaign against the abolition of the opt out to the maximum average 48 hour working week.

In June last year, ministers reached an agreement on a package of measures relating to the Working Time Directive, including retention of the opt out, but this was reversed by the European Parliament in December. The British Government wants to keep the opt out and ministers are now in talks with their European counterparts in a process referred to as 'conciliation'.

Simon Boyd of John Reid & Sons (Strucsteel), speaking on behalf of the BCSA ,said: "Our industry is one in which in good times and bad, work fluctuates and we have to be left free to work the necessary hours to be able to compete in a global market. We have been polling our workers and those of our subcontractors and some 94% want to keep the opt out".

For further information, please contact Marion Rich, Director of Legal and Contractual Affairs at the BCSA.

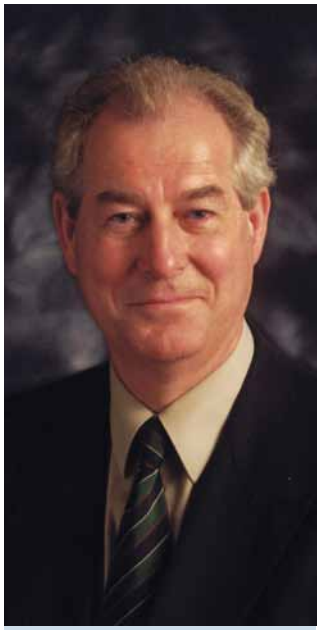
NEWS IN BRIEF

After a number of years of lobbying by the BCSA and its colleagues in the Specialist Engineering Contractors' Group, changes to the '**Construction Act**' were announced in the Queen's Speech last December. The changes, contained in Part 8 of the Local Democracy, Economic Development & Construction Bill, were introduced into the House of Lords on 4 December. Lord O'Neill has laid some amendments to part 8 of the Bill to strengthen the adjudication provisions and simplify the payment provisions.

Lindapter has launched the Type LS, a premium self-adjusting clamping system manufactured from high-grade stainless steel, designed for use in harsh environments. Dubbed the Claw, due to the aggressive curved and pointed shape, the clamp is suitable for various flange thicknesses and slopes up to 10 degrees.

CSC has been appointed as an authorised Autodesk AEC reseller for the supply of Autodesk Revit Structure, together with associated training and support services, within the UK and Republic of Ireland. Both companies are firmly committed to Revit Structure as they say it represents the future of BIM (Building Information Modelling) for structural engineers.

The steel framed headquarters building of contracting firm Fitzpatrick, erected by **Hambleton Steel**, won its fourth sustainability award, Building Magazine's 'Sustainable Building of the Year (Large Project)' for 2008. Use of environmental features has helped to reduce the building's carbon footprint by around 70% and led to the award of a BREEAM 'Excellent' rating.



Former BCSA President honoured

Tom Goldberg, BCSA President from 2003-05, has been awarded an MBE in the New Year Honours List 2009 for his work in assisting international trade.

He is well known in the steelwork sector and was formerly Joint Managing Director of Atlas Ward Structures. Currently he is a co-owner of a number of steelwork contractors based in the UK, Germany, Poland, Ukraine and China.

Steelwork climbs into top twenty

Caunton Engineering is currently erecting steelwork for a new head office and logistics centre for Teva, one of the top twenty pharmaceutical companies in the world.

Located in Castleford, West Yorkshire, the purpose built centre includes an 18,724m² warehouse and an integrated 4,875m² four-storey office block. The facility will be Teva's UK distribution hub and it will have a storage capacity five times greater than the company's current site.

Main contractor is Winvic Construction which is constructing the project for Teva on behalf of the developer ProLogis.

Seafront apartments are put in the frame

More than 200t of cold rolled steel from Metsec's Framing Division facilitated the fast track completion of two multi-storey apartment blocks on the seafront at North Bay, Scarborough.

The Sands is a multi-million pound phased leisure development on 55 acres of land owned by Scarborough Borough Council. Completing the scheme are 96 luxury one, two and three bedroom apartments and four penthouses.

Metframe contractors PAW Structures fabricated the lightweight framing elements offsite, bolting together light gauge galvanised steel components supplied already cut to length, then transported them to site for final assembly.

This time saving building technique meant that apartments were ready for the first residents to move into less than 21 months after demolition of the earlier buildings.

The two residential blocks, the five-storey Kepwick House, and the adjacent six-storey elliptical Lockton House, both include ground floor retail units.

The project's prefabricated structures include Metframe cantilevered balconies tied back into the main framework. Exterior walls are clad in cement particle board with an insulated rendered finish. The project was built for developer Benchmark Properties by main contractor Tolent Construction.

Diary

For all Corus events visit www.corusevents.com email events@corusgroup.com tel: 01724 405060
For all BCSA events contact Gillian Mitchell tel 020 7747 8121 email: gillian.mitchell@steelconstruction.org

4 February 2009
EC3 2 Day course
Dublin

11 February 2009
EC4 Composite Design Course
Dublin

12 February 2009
ISE Connection Design Course
Joint with ISE. London

24-25 February 2009
EC3 2 Day course
London

26 February 2009
Preparation for Eurocodes
Joint with ISE. London

3 March 2009
Steel Frame Solutions
Manchester

10 March 2009
EC4 Composite Design Course
Leeds

17 March 2009
Stability of Steel Frame Buildings
Joint with ISE. London

Countdown to Eurocode Implementation

March 2008 | April 2008 | May 2008 | June 2008 | July 2008 | August 2008 | September 2008 | October 2008 | November 2008 | December 2008 | January 2009 | February 2009 | March 2009 | April 2009 | May 2009

NA for EC3: Part 1.10 – Fracture toughness

The National Annex for *Eurocode 3: General rules and rules for buildings Part 1.10: Material toughness and through thickness properties* is currently with the BSI editor and is scheduled to be published early this year. This Eurocode gives a complex expression for determining fracture toughness which will be unfamiliar to most UK designers. Fortunately the NA is accompanied by a BSI Published Document *PD 6695-1 Recommendations for the design of structures to BS EN 1993-1-10* which gives a simple procedure together with look-up tables for the maximum thickness for internal steelwork in buildings (T_{md} = -5C) and the maximum thickness for external steelwork in buildings (T_{md} - -15C). The tables below compare the thicknesses from BS 5950-1 with EC3: Part 1.10 for welding general with k=1.0 for internal and external conditions.

The Eurocode together with its NA give limiting thicknesses which are similar to and in some cases better than those given in BS 5959-1.The PD is also scheduled for publication this year.

Maximum thicknesses – Internal

Steel grade and quality to BS EN 10025-2	BS 5950 Part 1 K = 1.0 Stress > 0.3 Y_{nom}	EC3 Part 1.10 ΔT_{RD} =0C	
		Stress = $0.3\sigma_{Ed}/f_y(t)$	Stress > $0.5\sigma_{Ed}/f_y(t)$
S275 JR S275 J0 S275 J2	36 mm 65 mm 94 mm	50 mm 85 mm 122.5 mm	40 mm 70 mm 102.5 mm
S355 JR S355 J0 S355 J2	25 mm 46 mm 66 mm	37.5 mm 67.5 mm 100 mm	22.5 mm 45 mm 67.5 mm

Maximum thicknesses – External

Steel grade and quality to BS EN 10025-2	BS 5950 Part 1 K = 1.0 Stress > 0.3 Y_{nom}	EC3 Part 1.10 ΔT_{RD} =0C	
		Stress = $0.3\sigma_{Ed}/f_y(t)$	Stress > $0.5\sigma_{Ed}/f_y(t)$
S275 JR S275 J0 S275 J2	20 mm 54 mm 78 mm	27.5 mm 70 mm 102.5 mm	22.5 mm 60 mm 85 mm
S355 JR S355 J0 S355 J2	14 mm 38 mm 55 mm	15 mm 45 mm 67.5 mm	12.5 mm 37.5 mm 55 mm

Swimming pool to kick-start regeneration

The Northamptonshire town of Corby has some ambitious plans which include rebuilding and redesigning large areas of the town centre. Martin Cooper reports from one of the first projects to near completion, a new 50m Olympic sized swimming pool.

After more than twenty five years of depression, which began with the closure of the local steelworks, things are definitely looking up in Corby. During the last few years, there has been real impetus to redevelop and a number of high profile jobs are currently ongoing which will transform the Northamptonshire town.

It all began in 2003 when Corby, along with other towns in the area (Kettering, Wellingborough and Northampton) was designated as a major growth area in the MKSM SRS (Milton Keynes and South Midlands Sub-regional Strategy), which, among other things, meant accommodating 16,800 new homes by the year 2021.

Corby Borough Council has some grand plans, a new and revamped town centre is underway, a new train station - with direct services to London - will shortly open, a new civic centre is under construction and the town will have one of the UK's few 50m-long Olympic sized swimming pools.

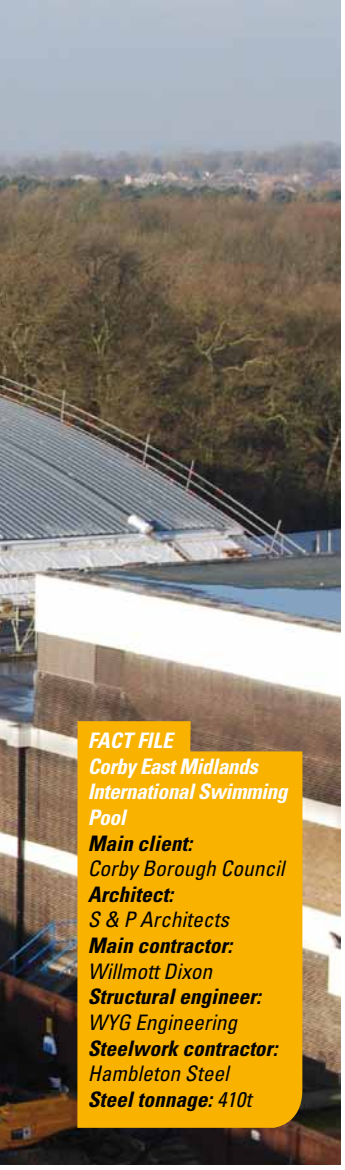
"It's all about putting Corby on the map," says Peter Griggs, Head of Special Projects for Corby Borough Council, explaining the decision to build only the second 50m pool in the East Midlands. "We have a lot of work currently underway and on the drawing board, the pool is an iconic structure and something the whole town will be proud of."

Officially titled the Corby East Midlands International Swimming Pool, the project is a real symbol of the regeneration of the town centre. The original plans envisaged a 25m pool, but this was later revised and the fact that it has already been shortlisted as a training venue for the London 2012 Olympics, the decision to go for the larger pool has been vindicated.

"A number of residents were initially sceptical about the town's plans," says Councillor John McGhee. "But since work has got under way and the spectacular swimming pool building has become visible, people have really got behind the project."

When it opens in June, the Corby pool will provide a 50m, eight lane main pool, national junior standard diving boards, a 20m learner pool, a fun pool with a flume, spectator seating for up to 400 people, health suite, a dance studio, a creche and a cafe.

The pool will be equipped with two sets of hydraulic barriers which can be raised to divide the pool into thirds when the full 50m length is not required. This will allow one sector for diving, another end for practice swimming and a central zone of 25m for short course racing.



FACT FILE
Corby East Midlands International Swimming Pool
Main client:
Corby Borough Council
Architect:
S & P Architects
Main contractor:
Willmott Dixon
Structural engineer:
WYG Engineering
Steelwork contractor:
Hambleton Steel
Steel tonnage: *410t*

Above: The pool will be the centrepiece of Corby's regeneration.

Above: The facility has been shortlisted as a training venue for the 2012 Olympic Games.

Left: The pool includes a flume and fun area.

Above: Cellular beams, which will remain exposed, have been used in the changing room areas as an architectural feature.

Work on the project began earlier this year, on a site which is located adjacent to Corby's existing 25m long swimming pool. The site was originally a surface car park and main contractor Willmott Dixon had to first excavate a basement level which meant digging down to a maximum depth of 6m. This task was not just to accommodate the pool itself, but also a system of air ducts that run beneath the pool, and pump rooms which are also located underground.

Covering the facility is a large curved steel framed structure which contains 410t of structural steelwork. However, the pool is formed with concrete and such is the depth of this material needed to accommodate the amount of water, there is actually more steel under the structure, as the concrete's rebar amounts to some 500t.

Early works predominantly involved concrete, the pool was cast, the slab for the remainder of the ground floor was also installed. This meant once the steelwork was ready to be erected over the pool, it had to be installed from the perimeter of the structure's footprint.

The pool will be equipped with two sets of hydraulic barriers which can be raised to divide the pool into thirds.

"We weren't allowed to run cranes within the pool, so everything was erected by a combination of the on site tower crane and a mobile crane positioned beside the pool," explains Andrew Aykroyd, Site Supervisor, Hambleton Steel Ltd.

Covering the pool area and forming the distinctive domed shape are a series of 32m long, 2.5m deep trusses. Spaced at 8m centres, the trusses were brought to site in two 16m sections. Lifting the trusses was one of the main challenges of the steelwork programme.

"Because the site is very confined we had nowhere to assemble the trusses on the ground, so we had to tandem lift them and then bolt them together in mid air," says Mr Aykroyd.

The steel trusses are structurally integral to the entire structure as they support the roof. Spanning the pool structure length wise, 90 degrees to the trusses, are a series of 80m long glulam rafters. These architectural feature beams thread though the steel trusses and are bolted down at either end to concrete plinths.

The glulam beams were too long to be brought to site in one section and they have been installed in a series of 8m long pieces. "We erected the timber rafters and purlins along with the steelwork, it made the programme easier," says Mr Aykroyd. "During the design process it was very challenging however, as we had to design connections to timber as well as the glazing."

Other notable steelwork includes the building's bracing, which is concentrated in lift and stair cores and has also been secreted along the structure's ends.

"The structure is basically a braced frame, and once the design had changed to a 50m pool we reinstated the steel profile by designing the steel trusses to be structurally integral," explains Bill Duke, Associate Director for WYG Design.

On one side of the pool the building features a terrace viewing gallery and opposite there is a two-storey changing room block. Cellular beams, mostly 800mm deep, have been used extensively in these areas.

"Most of the beams in the roof will be left exposed and so the design opted for cellular beams for appearance," explains Mr Duke. "Although some have been used at floor levels where there are service considerations."

Corby's swimming pool is scheduled to open on 29 June 2009 and Chris Stephenson, Corby Borough Council's Head of Service, says the town's decision to bite the bullet and go for an Olympic sized facility has been fully justified.

"The pool will help improve the town's wellbeing, create jobs and, importantly, it looks great - the design is first class."

Giant sports complex for Scotland

One of the UK's largest public sports centres is under construction in East Kilbride. Sporting facilities on offer at the Playsport Scotland project will include golf, football, tennis, badminton and swimming.

FACT FILE
Playsport Scotland complex, East Kilbride
Main client: *Playgolf Kilmartin*
Architect: *Smith Design Associates*
Structural engineer: *RPS*
Main contractor: *Sir Robert McAlpine*
Steelwork contractor: *Atlas Ward Structures*
Steel tonnage: *850t*

Above: The project's building has two steps because of the sloping topography.

"Despite the bad weather and the exposed nature of the site, the steel went up without any problems."

Below: Steel erection took 12 weeks

Below right: One section of the steel building contains a mezzanine level.

The Playsport Scotland development covers an area of 90 acres and is located adjacent to the Kingsgate Retail Park near East Kilbride, South Lanarkshire. The complex will include a nine hole PowerPlay golf course, a 58 bay golf driving range and golf academy, one of the UK's largest indoor tennis and badminton centre, five-a-side and seven-a-side football pitches and a health and fitness centre with a 25m swimming pool.

Indoor facilities are housed within a 20,438m^2 steel framed building erected by Atlas Ward Structures. As well as the tennis and fitness areas, the building will also contain a family centre with adventure golf, laser games and soft play area as well as conferencing space, a restaurant and sports retail outlets.

The main part of the building is a four span portal frame which incorporates an 8m slope. To take into account the topography of the ground the building has three sections, two which step down 4m each.

The upper section contains two floors, the family area and health and fitness zone on the ground floor, and retail and conference facilities above.

Stepping down the slope, the two lower sections of the portal frame both contain single storey tennis court zones.

"The building had to follow the profile of the land," explains David Mellow, Engineer of RPS. "Just below the surface the ground is basalt rock so earthmoving wasn't economical and the design had to incorporate steps." Because of the ground conditions, the building is founded on shallow pad foundations above the rock to avoid differential settlement.

The lower tennis court areas dictated the overall grid pattern for the entire structure. "A number of restrictions come into play with tennis courts, such as rooflight positioning, and this meant the optimum grid was set at 7.6m," adds Mr Mellor.

From the upper level of the main building a two tier driving range structure connects to a small two storey football pavillion.

Steel erection took 12 weeks and Atlas Ward began by erecting the upper section of the building and then worked down the slope.

"Despite the bad weather and the exposed nature of the site, the steel went up without any problems," sums up Atlas Ward Construction Manager Andrew Kilby. "There was a road right to the site and we used mobile cranes for all the erection."

Playsport Scotland will be the nation's most advanced public sports development. It is due to open in spring 2009.

Handling a complicated design

The door handle of a famous car marque was the inspiration behind the design of a new academy in Liverpool. Martin Cooper reports.

World famous it may be, but the Jaguar car isn't necessarily associated with Liverpool even though they roll off the production line at Halewood on Merseyside. But that's all about to change, thanks to a new school which has borrowed some of its design from a car - a Jaguar door handle to be precise.

The North LIverpool Academy, being built on former playing fields and within earshot of both of the city's football grounds - Anfield and Goodison Park - is predominantly a simple beam and column build. But what stands out is a central steel structure shaped liked a car door handle which is sandwiched between the academy's two teaching blocks.

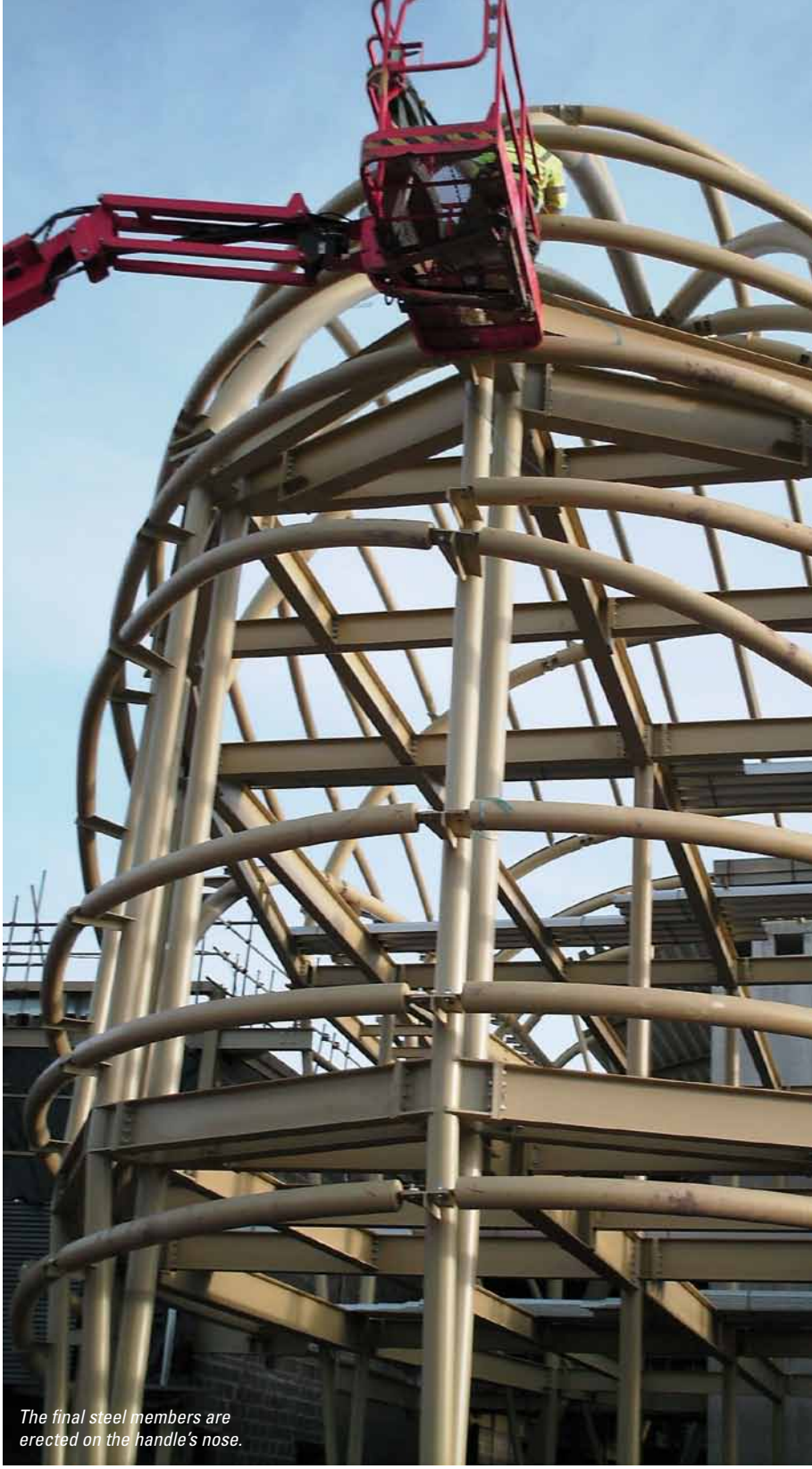
Dubbed the 'handle' the structure is not symmetrical about the short axis as the ridge along the length of the handle and at both the head and tail vary to create the desired shape. At three storeys high, it will stand a floor above the rest of the building. It is 140m long x 15.6m wide and requires 350t of structural steelwork.

Because of the complexity of the handle's shape, the steel erection part of the construction programme has been sequenced around its design. "Ordinarily the project would have been built north to south with the two teaching blocks and the central handle constructed as one. However, the design work needed for the handle was so involved that the two outer blocks were erected first, while the handle's design was still being finalised," explains Tony Foster, Wates Project Manager.

Fabrication drawings were made for each piece of steel. The sections of steel were welded then delivered to site in the order they would be needed. The connections were a challenge and it took time to analyse the loads which passed through the structure to make sure they were the right strength.

"The forces passing through the handle structure are hugely complex," says Paul Hayes, Project Manager for steelwork contractor Billington Structures. "Our design team were working on the model for more than six months."

"The outer two teaching blocks are standard build," adds Nick Garcea, Atkins Project Engineer. "However, the challenge in designing the handle



The final steel members are erected on the handle's nose.

The inspiration for the design was a Jaguar car door handle.

FACT FILE
North Liverpool Academy
Main client: North Liverpool Academy Trust
Architect: Atkins
Main contractor: Wates
Structural engineer: Atkins
Steelwork contractor: Billington Structures
Steel tonnage: 900t
Project value: £27M

was the fact that it's curved and also skewed by three degrees on plan, which means every connection is different."

The Academy's three blocks are all structurally independent, but there are steelwork connections and interfaces at first and second floor. Interface beams connect the outer blocks to the handle at first and second floor, but these have been designed to allow differential movements between blocks.

The two storey outer teaching blocks were erected around a 7m grid pattern and will predominantly house classrooms. However, the eastern block also contains a sports hall which has column free spans of up to 23m and required a series of 1.25m deep trusses.

Both blocks also feature three ETFE covered lightwells, which are located above common areas. The western block's lightwells have 16m spans, while the slightly narrower eastern block's lightwells have spans considerably smaller at 4.5m.

"Once the teaching blocks were erected we began erecting the handle from its tail, and then worked through to the head using a 60t capacity crane."

Primary bowstring trusses at 12m centres - all of differing length and depth - supported on oval sections form the handle. Above this, steel ribs at roof level then form the distinctive rounded shape. There are cruciform connections at quarter points, and adding to the complexity, all CHS sections are unique because of the structure's changing shape.

The construction team are adamant the handle shape will be inspirational to future students

"The connections are all bespoke and they will remain exposed for architectural and aesthetic reasons, so we had to cover them with steel plates," adds Mr Hayes.

As well as the complicated design and fabrication work undertaken by Billington, the company also had to make sure all steel members arrived on site in the order they were needed.

"This wasn't so much of a priority with the teaching blocks," says Mr Hayes. "But because all the steel members for the handle are unique we had to make sure they arrived on site as needed."

The sequencing for steelwork deliveries also included the bowstring trusses as they vary in size, although they are typically around 14m long. The trusses are positioned on first floor level and span in two directions. As well as supporting the rib steelwork the trusses also allow the ground floor area of the handle to be an open area which will be the academy's canteen.

The steel ribs are in a sequence of perpendicular tangential arcs which give a smooth shape and help make the handle erectable.

Stability for the handle is achieved through diaphragm action of the floor plate transferring lateral loads to the lift shafts at both the head and the tail. The connections to the lift shaft at the head allow longitudinal temperature movements.

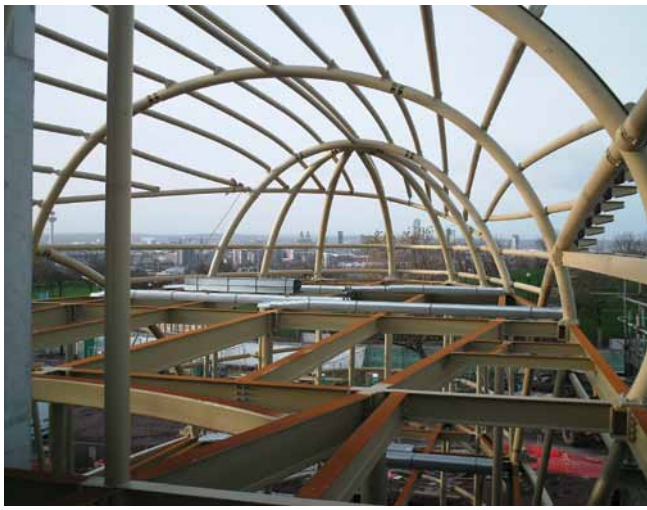
One of the most technically challenging parts of the project was getting the curves of the handle's head and tail sections as smooth as possible. Because of the shape a lot of thought went into what materials could be used for cladding.

To prevent faceting three layers of single plywood membrane have been applied to the head and tail sections of the handle and finished with a plastic silver grey membrane coating. The main body of the handle only requires two layers of ply to get the curve correct.

Curved tubular purlins and sheeting rails will also help give the external shape to the head and tail sections.

The majority of the of the roof will be constructed using 200mm metal decking fixed to the steel ribs. To get the smooth continuous surface for the roof, welded steel plates have been added to the top of the CHS supports. On the head of the handle, 48mm decking sheets have been installed to get the required tighter curves.

As to the question why the handle shape was chosen, the construction team are adamant it will be inspirational to the future students, although at first there was some local opposition.



Above: Steel ribs form the arc of the handle's shape.

Below: A series of bowstring trusses support the handle.

Transport peaks at Glasgow museum

Steel is showing its great flexibility and quality on a challenging design for a new transport museum in Glasgow. Martin Cooper reports on the unique geometry of its iconic twisting and curving steel frame.

Each of the five roof peaks has a different height.

Left: As the erection process proceeds temporary props are positioned below the roof nodes.

Scotland has a rich tradition in the transport and related engineering industries, and no area more so than Glasgow. For hundreds of years the Clyde was home to a thriving and famous shipbuilding industry, so much so that the term 'Clyde built' was recognised as a sign of quality and engineering excellence throughout the world. Locomotives made at the city's famous Springburn works went to power the transport networks of an empire.

Today, the former docks and quays along the Clyde are being transformed as a multi-million pound regeneration programme is breathing new life into the area. One of the most prestigious and eye-catching projects is the Riverside Museum, a new iconic museum to showcase the city's contribution to transport.

Due to open in 2011, the new museum will replace the current Museum of Transport, located nearby at Kelvin Hall, and will display more than 3,000 transportation related objects, including the locally-built Tall Ship Glenlee, which will be moored alongside the building.

The museum is being built on a 1.2ha site at the confluence of the Clyde and Kelvin rivers, one of the few intact areas of historic quayside, and a fitting reminder of the city's shipbuilding past.

Work on site started in 2007 and the design of the building was the brainchild of much-acclaimed architect Zaha Hadid. The building is a twisting and curving steel framed structure on plan with two folds or transition zones (the points at which the building's straight planes turn), while the roof is an innovative pleated concept with five peaks and valleys.

With two main facades, one facing the city and the other leading directly to the riverfront, the design creates a tunnel-like building which will create a historic transportation journey for visitors.

Advance works carried out by BAM Construction included ground clearing and digging out the old foundations of the site's former warehouses. Once this was complete an extensive piling programme took place with precast and in-situ piles installed.

This allowed the ground floor slab to be cast ahead of steel erection. "The steelwork has dictated the construction programme," says BAM's Construction Manager, Jim Ward. "Because of the complex design we have divided the steel erection into seven phases with the slab being cast ahead of the steel erection."

A sequential programme means the steel erectors are predominantly working off of a clean and smooth concrete slab, while the cladding contractor has been able to begin its work by following on behind the steelwork.

The superstructure's heavily reinforced slab has been designed as a continuous suspended flat slab, which will be taking some extremely heavy loadings from the museum's exhibits, such as locomotives. Within the slab and below the ground floor a series of service trenches, 3m x 3m, allow routing of duct work and electrical services to be hidden under the exhibition space.

Large open column free spaces, up to 50m wide in places, have been achieved by forming the

Right: The roof nodes or cans are mostly unique and are able to accept up to ten steel members.

FACT FILE
Glasgow Riverside Museum
Client: *Glasgow City Council Cultural Leisure Services*
Architect: *Zaha Hadid Associates*
Main Contractor: *BAM Construction*
Structural engineer: *Buro Happold*
Steelwork contractor: *Watson Steel Structures*
Steel tonnage: *2,525t*

innovative roof with a series of inclined trusses, following the external geometry of the roof, which utilises folded plate action. The inclined planes are supported at the north and south facades on a series of structural mullions and within the building at the two transition zones.

"The project's geometry is unique," explains Tim Kelly, Senior Engineer for Buro Happold. "The structure exploits the convex and concave geometry to form a locked structure which spans across the width of the exhibition space to the column lines which flank the building."

Along the two outer perimeter elevations the museum features two-storey exhibition areas. Here, cross bracing has been hidden that aids overall stability, which is also derived from portal action at various points in the steel frame.

Phase one of steel erection consisted of a two-storey zone approximately halfway along the eastern elevation. This zone was chosen as the starting point as it would stand up without any propping. From here on, other phases are now being erected which are connected to the initial zone, and three of these subsequent areas are all supported with temporary props and trestles.

"The project's geometry is unique."

The props are predominantly CHS sections and are connected to roof nodes via an 80mm diameter pin. "We've designed the props so they can be re-used throughout the project," explains Andrew Hart, Watson Steel Structures' Contract Manager.

"As the erection front of each zone moves forward, it is progressively de-propped from the rear with the majority of the temporary members being used again in later zones."

During February the project's first de-propping exercise will take place with a total of 27 temporary props and trestles due to be lowered in one day.

The steel pleated roof, featuring five differing peaks, of which the highest is 18m above ground level, is the most complex part of the project. Watson Steel has designed a unique node connection (dubbed a can) which can accommodate the numerous incoming rafters, bracing and ridge valley members which form the roof.

As the roof pitches at various angles and also slopes from south to north, most nodes or cans are unique and can accept up to ten steel members. The biggest node is approximately 1m in diameter.

"We have 25 lever arch files full of connection calculations at our office," explains Mr Hart. "The majority of roof connections are unique to a single joint and are fabricated using individual jigs that are modelled in XSteel. The curved ridge and valley members, meanwhile, have been fabricated using multi-jigs."

Not only working out the complex roof connections, but also the de-propping programme, has called for close cooperation between Watson Steel and Buro Happold, with models continually passing back and forth.

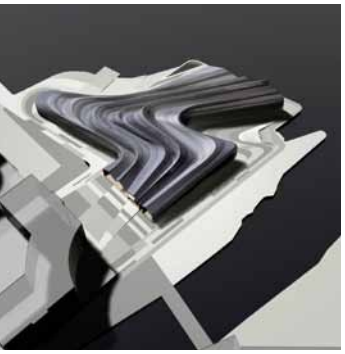
One of the museum's most important exhibits will be a locally-built steam locomotive known as Loco No. 9. To give the loco a prominent position it will be displayed above first floor level supported on a large steel truss. The truss is curved in plan (because of the building's shape) and spans 30m between two perimeter columns. The truss supports both the roof and the first floor exhibition area. The top cord is formed from a valley beam of the roof, and the lower cord by the edge beam at first floor.

Towards the riverside entrance of the building another large truss, known as the paternoster truss, has been erected. This 26m span element was brought to site in three pieces and assembled on the ground before being tandem lifted into position as one 26t section. This will support a revolving wheel which will house numerous models of ships which were built on the River Clyde.

Turning such an ambitious design into reality has required some in depth and lengthy cooperation between all those involved. When it opens in 2011 the Riverside Museum should reinforce Glasgow's reputation as an engineering and tourism hotspot.

And as Mr Ward sums up: "It will be an attraction that team members will be proud to bring their children to."

Below: Impressions showing the twisting on plan design and the roof's valleys and peaks.



Boldon Nursery
Joseph Chamberlain College, Birmingham
Holmesdale Technology College, Kent
North Street School, Ashford
Milton Keynes Academy
The Bridge Schools, Holloway, London
The Business Academy, Bexley
Camborne Primary School
Oasis Academy, Enfield
Filton College, Bristol
New Windsor Nursery School, Wolverhampton
Blandford Primary School, Cosbridge
Buttershaw School, Bradford
John Bright School, Llandudno
Avon Valley Secondary School, Normanton
East Riding College, Bridlington
St Mirin Secondary School, Paisley
Usworth Sixth Form College
Hawkstock School, Camden
Kesh Primary School, Co Fermanagh
Arthur Terry Secondary School, Birmingham
Performing Arts Studio, Bath Spa University College
La Salle Secondary School, Belfast
Bankton Primary School, Livingston
Greenbank High School, Southport

BCSA

corus

Top Marks – over 70% of all new UK educational buildings use a structural steel frame

To find a steelwork contractor to help build your new school, college or university, visit

www.steelconstruction.org

Machinery investment boosts quality

Advances in quality and productivity in the steel construction sector are to a large part due to developments in fabricating machinery. The last of our Supply Chain series explains the role of the equipment manufacturers.

A steady flow of new machine introductions continues to give steelwork contractors efficiency gains.

Manufacturers of steelwork fabrication equipment have invested heavily in research and development to produce the technological advances required by today's steel construction sector.

Thanks to this continuous improvement, state-of-the-art machinery has been made available from international manufacturers that has helped the UK's steel construction sector improve productivity and efficiency to become the envy of the world.

The last 15 years or so in particular has been marked by continual investment in new technology by the UK steel construction sector, making it the most efficient producers of ready to erect structural steel in the world. A steady flow of new machine introductions continue to give steelwork contractors efficiency gains, which are essential to succeed in a very competitive market.

Whether a company needs a saw, drill, punch and shearing line, profiler, coper or a combination of the aforementioned, today's fabrication equipment is easier to use than previous generations and offers greater productivity with a wider possible throughput of materials.

Other important processes include shot blasting, for clean preparation of steel, and auto painting, which is usually fully integrated as a follow on in-line process from shot blasting. Major steelwork contractors and key structural steel stockholders have shot blast and auto paint lines.

Sawing and drilling are fundamental to structural steel processing, usually in series with a shot blast and auto paint line and often with a coping process. Modern systems are totally integrated and physically linked by conveyors and crossways and controlled by machine specific and total system software.

Manufacturers are continually developing their products and one of the most significant advances has been in controls. Modern electronic controls have made machinery easier to use and, along with computer technology, huge advances have been made.

For instance, bandsaw technology has improved with touch-screen user friendly input and down-the-line machine instruction capabilities, which have refined process control and efficiency. Significant improvements in bandsaw blade technology have resulted in faster precision sawing and more throughput.

Computer Numerically Controlled (CNC) machinery is the standard today and offers a number of advantages. It is more effective with: single end cuts, arranged square to the member length, which eliminates the set up time that would be needed when changing to another angle or cut; one hole diameter on any one piece, which avoids the need for drill bit changes; and alignment of holes on an axis square to the member length,

Below: A Peddinghaus FPDB-2500, a plate machine with punching, drilling and marking capabilities along with plasma and oxy cutting options.

Above: Ficep Automatic CNC machines with scribing facility at Elland Steel's yard.

holes in webs and flanges aligned, which reduces the need to move the member between drilling operations.

Drilling machines are an essential item for the steel fabrication sector. A major advance for these machines was the introduction of solid carbide drills. Using carbide throughout the working length of a drilling bit allows much faster cutting speeds and greater forces, typically achieving a 300% advance over TCT (Tungsten Carbide Tipped) drills and 500% improvement over HSS (High Speed Steel) drills. Solid carbide is also economical as it enables numerous re-sharpening of the bit.

As an alternative to purchasing individual machines, there has been a trend over the last year or so for complete lines to be produced and installed at steel fabrication facilities. Manufacturers say this is the best means of achieving the most efficient, fully integrated process and control solution.

After sales is another area which has seen a number of advances in recent times. Once a customer has invested in a new machine or processing line, it wants to be sure it works and continues to work properly. To this end manufacturers employ more technicians to help with after sales and service contracts.

In addition to the standard warranty which comes with any new piece of machinery, manufacturers also offer a range a service contracts. The basic elements of each contract usually include the servicing of machines, restoration of factory settings, reduction in the cost of spare parts and a full service history for the machine.

Not only do such contracts provide customers with peace of mind, but they also have the option of deciding exactly what level of service they require, allowing the servicing costs to be accurately budgeted in advance.

Remote diagnostics is now integral as it allows technicians and service engineers to repair equipment without actually visiting the fabricator. As long as there is a computer link, a technician can fix an item of machinery from anywhere in the world. This saves time and means repairs are executed faster.

The immediate response made to customers and advanced diagnostic capabilities ensure total support, backed by a wide range of spare parts . Basic spare parts are normally carried by service engineers to ensure machine down-time is kept to a minimum.

Manufacturers also provide a programme of continuous training and manuals as well as software updates which can be easily downloaded via the internet.

Training is an important element for any new piece of machinery. Manufacturers often offer a training programme for a customer which may also include a visit to the production facility. This allows the future operative the chance to see the machine being built as well as observing it in full production mode.

Recognition is given to the following companies which are supporting the BCSA/Corus steel construction market development programme.
Ficep (UK) Ltd
Peddinghaus
Corporation UK Ltd
Voortman UK Ltd

Below: A Voortman V630 CNC controlled drilling machine.

Above: The building sits on a busy junction opposite Victoria Station.

Commercial landmark for Victoria

The number of planned office developments across the UK has taken a dip in recent months, however there are still many on-going projects including a prestigious building opposite London's Victoria Station.

FACT FILE
Abford House, 333 Vauxhall Bridge Road, London
Main client: *Heron International*
Architect: *Sheppard Robson*
Main contractor: *Carillion*
Structural engineer: *Arup*
Steelwork contractor: *Bourne Steel*
Steel tonnage: *1,150t*
Project value: *£37M*

A new landmark commercial building is rising up opposite Victoria Station, on a plot bounded by Vauxhall Bridge Road, Wilton Street and Victoria Street. Befitting a structure on such a prominent and prestigious site, the D-shaped nine-storey building, known as Abford House, will be topped with a dramatic curved roof and feature a large double height entrance area at ground level.

Offering an overall floorspace of some 12,000m^2, Abford House replaces two Victorian office blocks that occupied the site until being demolished in 2007. Once the site had been cleared main contractor Carillion excavated and formed a new concrete lined two-level basement to replace the existing one floor of basement.

The superstructure for the new building is steel framed, as many high-rise commercial developments are for reasons of cost, efficiency and speed of construction.

Abford House's steel frame begins at the upper basement level (-1) and despite the fact that the structure abuts the adjacent Apollo Theatre on one elevation, the building is completely free-standing.

The perimeter columns are all spaced at 7.5m intervals but one member at ground floor level was installed as a raking column. "There was an old substation on the site and so the foundation work and the erection of new steelwork had to be slightly diverted around it," explains Steve Peet, Chief Engineer for Arup. "We designed a raking column which cantilevered over the substation. In this way the steelwork erection wasn't held up while the substation was removed."

As well as the core the structure's stability is also derived nominally from the building's curved facade which has been designed as a moment frame.

Looking at the building from ground level the most noticeable feature is the entrance area situated at the nose, or tip, of its D-shaped footprint. A double-

Three new releases on one disc...

Introducing the **Westok Design Suite** - a collection of three new items of SCI software, all contained on one CD:

... and our previous hits, re-mastered.

Cellular Beams - Engineers Design Guide - 48-page

Binder

Ultra Shallow Floor Beams Design Guide - 20-page

UPDATED

Westok CELLBEAM v7.0 AutoMate

CELLBEAM AutoMate v7.0
The latest version of SCI's well-established cellular beam design software.

NEW

Westok USFB AutoMate v1.0

USFB AutoMate v1.0
The first ever software to design Ultra Shallow Floor Beams. Also written by SCI.

NEW

Westok CellVibe v1.0

CellVibe v1.0
Written by SCI in accordance with P354, *The Design Guide on the Vibration of Floors*, this software quickly calculates a floor's critical response factor.

To receive a **FREE** copy of the **Westok Design Suite** please complete the details below and fax back to Westok. Alternatively, email your request to **info@westok.co.uk** or phone **01924 264121**.

FAX YOUR REQUEST TO WESTOK ON 01924 280030

- Please send me a FREE copy of the **Westok Design Suite**. ☐

- Please contact me to arrange one of the following CPD Seminars:
  - ☐ **- Cellular Beams & USFBs - Design & Applications**
  - ☐ **- Vibration & Floor Response Analysis + CellVibe Software Use**
  - ☐ **- Westok Design Suite Software Training Session**

Please tick as appropriate

Name: _____

Position: _____

Company: _____

Address: _____

_____ Postcode: _____

Tel: _____ Email: _____

ASD Westok Limited
Charles Roberts Office Park
Charles Street, Horbury Junction
Wakefield, West Yorkshire
WF4 5ER

Tel: 01924 264121
Fax: 01924 280030
Email: design@westok.co.uk

www.westok.co.uk

height recessed facade has perimeter columns forming an external colonnade for pedestrian use, while internally it is column free, giving it an open plan feel.

Set back from the tip of the structure's perimeter columns, the entrance area also contains a mezzanine floor which is hung from the above second floor, which means there are no columns intruding into the area.

"Erection of the under slung floor introduced some complexities into the steelwork build sequence," explains Charlie Rowell, Construction Director for Bourne Steel. "The first floor was installed initially supported on temporary columns and jacks. Once the upper floors of the structure had been erected and the second floor concrete poured, these temporary columns were removed by releasing the jacks, transferring the weight of the first floor to the second floor above."

From the second floor upwards the building's steelwork grid pattern is based around the one concrete core and two central internal columns. Either side of these columns there are two long 15.3m spans, formed with cellular beams. As well as the core the structure's stability is also derived nominally from the building's curved facade which has been designed as a moment frame.

According to Mr Peet, the use of Fabsec cellular beams was chosen for all floors for their efficiency, as all services can be kept within the structural void and run through the beams holes. The use of cellular beams also means the floor to ceiling heights can be maximised and the building has added flexibility for possible multi tenancy and various service needs.

Between the basement and second floor level

Above: The two large 15m spans are a feature of all floors.

The upper floors of the project step back and feature a large mansard.

Below: The D-Shaped nose of the building incorporates a pedestrian colonnade.

two heavy load bearing internal central columns are spliced at each floor level. "We had to keep the steel member weights within the 5t lift capacity of the site's only tower crane," explains Mr Rowell.

At the seventh floor the structure takes on a slightly different design, although still based around the one southern core and two internal columns. Here the building steps back and incorporates a large mansard.

Also constructed with cellular beams the two storey mansard follows the building's D-shape and consequently the eighth and ninth floors are also set back.

Over-sailing the entire structure will be a large curving roof, nicknamed the 'bonnet'. Formed by a series of tubular arched sections it will be clad with louvres and will give the building a dramatic signature topping.

Bourne gives birth to new company

The Bourne Group has launched a new company known as Bourne Site Services, which has been formed to provide a focus for the construction activities of Bourne Steel, Bourne London, Bourne Western and Bourne Special Projects.

"Works of all sizes and complexity will be undertaken by the new company, with projects larger in size than Abford House down to jobs involving minor steelwork elements," explains Charlie Rowell, Construction Director for Bourne Steel.

The new business will allow the Group to better co-ordinate the site delivery of their wide range of services which include structural steelwork, architectural metalwork, steel stairs, precast flooring and stairs, cladding, metal decking, off-site modularisation and turnkey carparks.

BS 9999: A new approach to design of fire precautions in buildings

John Dowling, Construction Development Manager at Corus, and Brian Kirby, Sirius Fire Safety Consultants explain the advantages of BS 9999, a new code of practice for fire safety in design, management and use of buildings.

Since the mid 1980s, fire precautions in buildings in England and Wales have been designed principally to the provisions of Approved Document B to the Building Regulations, making regular reference to BS 5588, *Fire precautions in the design, construction & use of buildings.*

The Approved Document approach has served its purpose well, but the past decades have seen a significant commitment in the UK to research into fire behaviour, which has resulted in improvements in knowledge and understanding of fire behaviour and how risk is created in fire. As a consequence, many of the provisions of the Approved Document are now recognised as outdated and/or overly conservative; something which has led to the increased use of fire engineered solutions, especially for large and complex buildings, (although it should be acknowledged that the improved level of knowledge has also exposed areas where the provisions of the Approved Document could be said to be unconservative, a possibility acknowledged in the introduction of that publication).

The increasing use of fire engineered solutions has led, in 2001, to the publication of BS 7974, *Application of fire safety engineering principles to the design of buildings.* This is a high level document which sets out the processes and procedures to be applied when adopting a fire engineered solution for a building. It is used primarily by experts in the field.

The increasing knowledge of fire behaviour and the obvious limitations of the Approved Document approach to fire precautions has made it clear for some time that there was scope for another approach which would sit between that publication and the fire engineering approach. The result has been the creation of BS 9999, *Code of practice for fire safety in the design, management and use of buildings*, published in October 2008, following a ten-year development period. Whilst prescriptive, the new Code allows the user to vary the solutions required to meet the provisions of the Building Regulations according to the particular circumstances of the building. On publication, the BSI said: "The standard builds on government guidance to legislative requirements, providing an advanced approach to fire safety in the design, management and use of buildings. It promotes a more flexible approach to fire safety design through use of structured risk-based design where designers can take account of varying human factors."

BS 9999 does not sit in opposition to Approved Document B. Nevertheless, it is understood that, after April 2009, all references to BS 5588 will be withdrawn from the Approved Document, a development which will probably accelerate the widespread adoption of the new standard.

One of the most obvious changes in BS 9999 involves structural fire resistance requirements, and this is generally good news for the steel construction sector. The Approved Document generally required 60 minutes fire resistance for buildings up to 18m in height; 90 minutes for buildings between 18 and 30m and 120 minutes plus a sprinkler system for buildings over 30m in height. Some reductions are allowed in these ratings for buildings under 30m where sprinklers are installed but these are not usually cost effective and are rarely invoked.

That option is still available in BS 9999 but it is complemented by an alternative approach which classifies buildings according to a risk profile based on occupancy, fire growth rate, ventilation conditions and height. There are limitations on the buildings on which this approach can be used, based on ventilation area, but it is expected that few buildings will be excluded. The risk profile of the building, and therefore the fire resistance requirement, can be reduced if a sprinkler is installed. Sprinklers are not mandatory in any building although two separate statements are made to the effect that, for heights over 30m or for heights over 30m in buildings using phased evacuation, sprinklers should be installed.

BS 9999 allows more attractive trade offs for automatic sprinkler installation and automatic fire detection than are generally available in the Approved Document. The following example is given for a shop with a risk profile requiring 45 minutes fire resistance, a maximum two way travel distance of 40m, a ceiling height of 4.5m and a minimum door width per person of 6mm:

If a shop sales area with this risk profile is fitted

with sprinklers its risk profile reduces and the maximum two-way travel distance is increased from 40m to 50m. Similarly the maximum one-way travel distance may be increased from 16m to 20m. The fire rating can be reduced from 45 to 30 minutes. If a smoke detection system and a voice alarm giving evacuation instructions are also fitted, the maximum two-way travel distance may be increased by 15% from 50m to 57.5m. Similarly the maximum one-way travel distance may be increased from 20m to 23m. If the ceiling height is between 4m and 5m, an additional 10% may be added, to bring the limits to 63.25m and 25.3m. The limits are 75m and 24m for two-way and one-way travel distances, so in this example the limits would be 63.25m and 24m. For the same shop with sprinklers, the minimum door width per person can be reduced to 4.1mm. Fitting a smoke detection system and a voice alarm giving evacuation instructions permits the width to be reduced by 15% to 3.48mm per person. If the ceiling height is between 4m and 5m, the width may be reduced an additional 10% to 3.13mm. This is less than the minimum value of 3.3mm allowed for the risk profile, so in this example the minimum limit of 3.3mm would be used.

The increased travel distances with increased storey height simply reflects what is already known and adopted by fire engineers in that the higher the ceiling, the longer it takes for smoke to fill the compartment and therefore the lower the risk.

Fire resistance requirements for a number of common building types are compared in the following table:

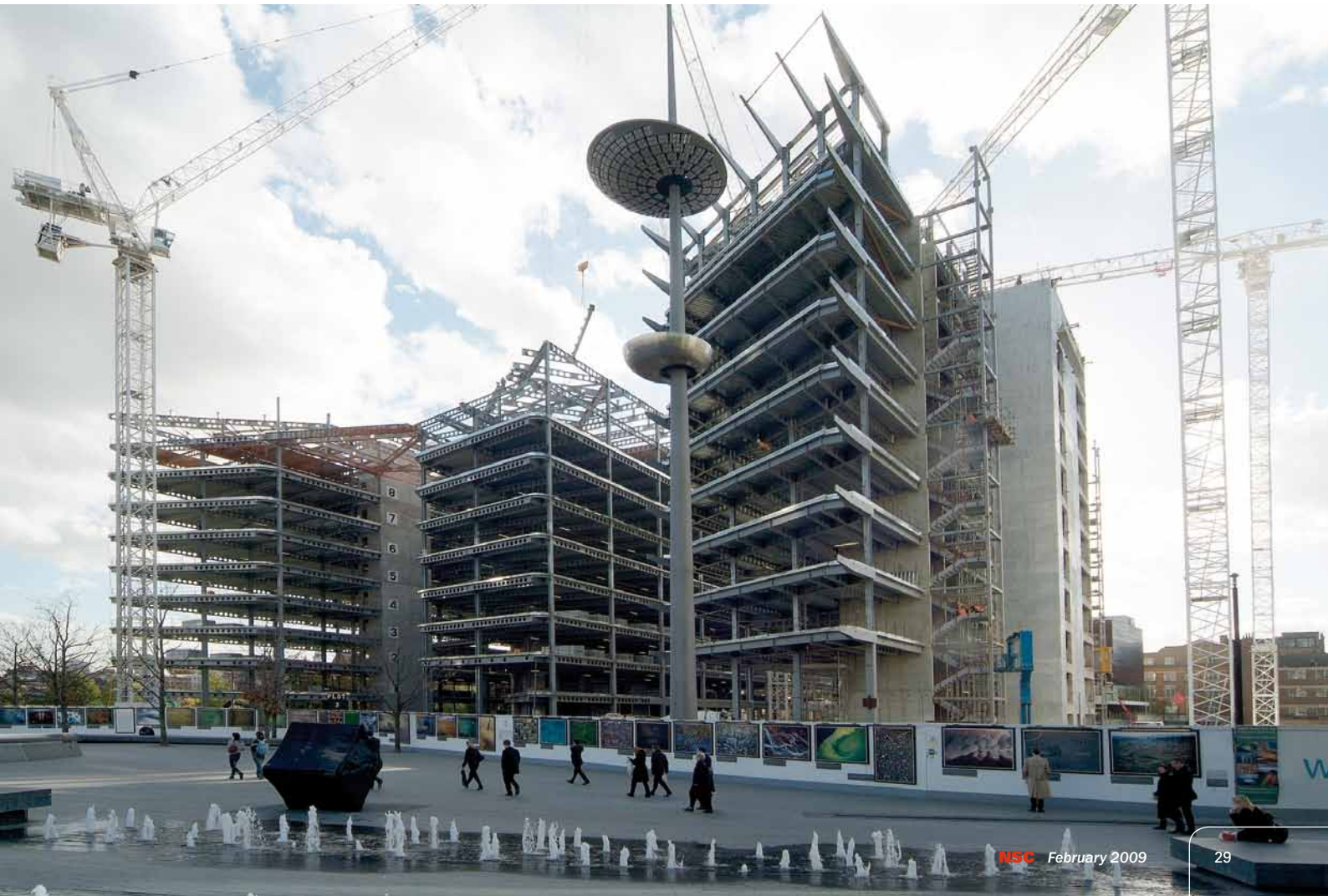
Building Description+	Approved Document B (mins)	BS 9999 without sprinklers (mins)	BS 9999 with sprinklers (mins)
Open plan office building, 2 storey, less than 1000m^2 ground floor area.	30	15*	15*
Open plan office building over 30m but less than 60m in height.	120 plus sprinklers	90#	60
3 storey Department store.	60	45	30
Department store between 11m and 18m in height.	60	75	60
Medium risk, 4 storey storage.	90	90	60
Leisure centre, 2 storey.	60	30	30

+ Height is measured from ground to the height of the floor of the top storey

* Most steel members can achieve 15 minutes fire resistance without added protection

\# It is unlikely that planning permission would be given without sprinklers

Below: Projects such as More London may benefit from BS 9999's more flexible approach to fire safety design as consultants can take into account varying human factors.



Is the UK ready for the Eurocodes?

In October 2008, all SCI members in the UK were invited to complete a short survey on the steel sector's preparations for the Eurocodes. David Brown, SCI Deputy Director, sums up the survey findings

The survey

The survey was undertaken to inform a presentation at the BCSA's Midland and Southern Branch in December 2008, and provides a good snapshot of opinion and progress.

The response rate to the survey was around 1 in 7, which is considered relatively high. Perhaps many respondees saw the survey as an opportunity to share their (often strong) views on the Eurocodes! The main bulk of the responses (57%) were from consulting engineers. Steelwork Contractors accounted for 32% of the responses with the remainder including academics and local authorities.

Awareness

The first question concerned awareness of the Eurocodes, and asked if Clients had enquired about Eurocode designs, or if any design had already been undertaken to the Eurocodes. Overall, around 75% of the responses were a resounding "no", with no real difference between consultants and contractors. A modest 18% indicated that clients were aware, or that designs to the Eurocodes had been either trialled or undertaken already.

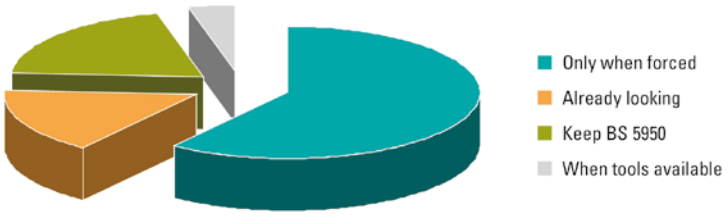


Figure 1. When will you (Consultants) design to the Eurocodes?

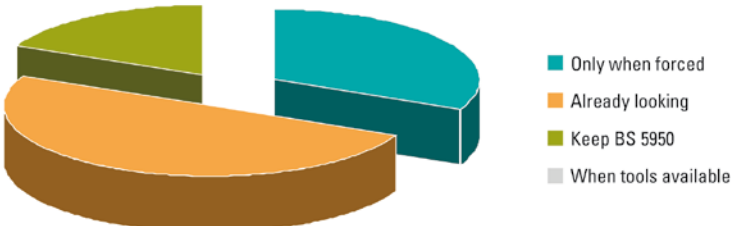


Figure 2. When will you (Steelwork Contractors) design to the Eurocodes?

Timetable of change

The second question asked about likely timetables to change to the Eurocodes. It had been anticipated that many responses would have indicated 2010, or 2015. These two dates are significant since 2010 was the original date for withdrawal of National Standards. BS 5950 is due to be reviewed in 2009, and assuming a new lease of life for 5 years, would therefore remain officially appropriate until around 2015.

The response from consulting engineers is shown in Figure 1.

The corresponding response from Steelwork Contractors is shown in Figure 2.

From both groups, there is a significant proportion who anticipate design to the Eurocodes in 2010. Also in both groups, approximately 25% indicate that they will resist changing design Standards (indicated by a response of "when forced" or "a long time"). In both groups, there were a number of comments about the importance of software are a pre-requisite to change.

The latest news is that Approved Document A of the Building Regulations may change in 2010, with the likely removal of BS 5950 and replacement with BS EN 1993. Although the UK Building Regulations do not demand the use of any particular Standard, listed or not, it is likely that many designers will see the change in the Regulations as a significant driver to change to Eurocode design.

Why might change be considered?

The next question was designed to elicit any perceptions that the change might be a positive move. The response were clear – around 75% (more in the Consulting Engineer cohort) simply said that they would only change from BS 5950 design "if forced to do so". A modest number indicated that the EU-wide market was an attraction, and some considered that change had economic benefit which might lead to competitive advantage.

If BS 5950 remains, why will you change?

This question presumed that BS 5950 could continue to be used for many years, and asked about change. The responses of the Steelwork Contractors are shown in Figure 3 and the responses from the consulting community in Figure 4.

The difference in response to this question is significant. The response from Consulting Engineers appears to indicate that despite wishing to keep BS 5950, a significant proportion are already looking at the Eurocodes, presumably anticipating that they will have to change at some point in the relatively near future. This will have an inevitable effect on the Contractors who follow in the supply chain.

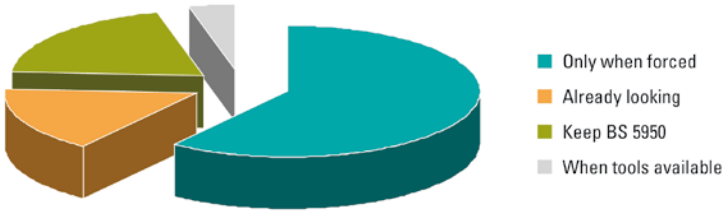


Figure 3. Why change from BS 5950? (Steelwork Contractors).

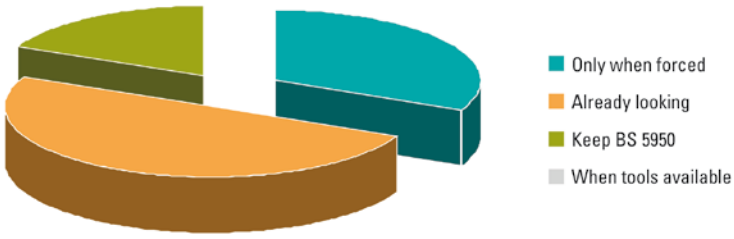


Figure 4. Why change from BS 5950? (Consultants).

Other members of the supply chain

Respondees were asked to indicate if they thought those following them in the supply chain were prepared for design to the Eurocodes. Overwhelmingly, the view was that they were not ready. A modest proportion of Steelwork Contractors thought others were aware, noting bolt suppliers and cold rolled component manufacturers.

The good, bad and ugly comments

The opportunity to share views was taken by most people who completed the survey, and these were generally helpful, and always illuminating.

Only a few could see any advantage in change. The habit of the UK lagging behind the rest of Europe was mentioned, and it was suggested that the survey contained an implied resistance to change, which was inappropriate. Some with markets wider than the UK saw the Eurocodes as a significant advantage.

Many comments concerned support tools, and particularly software. It was considered that software was essential, with a strong sense that bugs were inevitable – several thought that waiting for software (and training courses) to "mature" would be sensible.

Technically, there were clearly some who had spent some time looking in detail at the Eurocodes, and a very small proportion who had used them. It was noted that the "change is not as big as that from BS 449 to BS 5950" and "they are not as technically challenging as was thought". From those few who had used the Eurocodes, the view was that they did not offer economic advantage, were too scientific, were incomplete and there were too many nationally determined parameters.

There were conflicting views on inevitability. The idea of the Eurocodes being inevitable was described as "utter rubbish", whilst at the same time others considered that designers had accepted they were inevitable, "apart from a few pockets of resistance". Some recommended a speedy implementation, and others a drawn out programme.

Without doubt, the main message was one of cost. Consistently, responses bemoaned the cost of the documents, the guides and the training, and pointed out that for Consultants, the problem was magnified since they were multi-material. Most observed that professional fees were wholly inadequate to cover the cost of the change.

There was limited harsh criticism – reserved mainly for the fundamental idea of Eurocodes and the EU in general. There was some collateral criticism of the SCI, perceived by a few to be blindly supporting the Eurocodes, and encouraging opposition.

Conclusions and observations

Given a choice, it would appear that most respondees would prefer to have nothing to do with the Eurocodes, and retain National Standards unless "forced" to change. There are clearly very significant and real concerns about the cost of the change, especially for smaller practices and when considering the challenge repeated across several materials. Unfortunately, the plan to remove barriers to trade was instigated by political will some 30 years ago, and it seems highly likely that the Eurocodes will be implemented at some stage. For many, that date may be uncomfortably close, if the Building Regulations are changed in 2010. The full suite of Eurocodes with National Annexes will be complete early in 2009, so design could be undertaken immediately.

Despite the majority who would prefer not to change, the SCI view is that implementation is inevitable. There are several possible drivers, including the probable changes to the Building Regulations mentioned previously. These include publicly-funded work, where Eurocode design is more likely, pressure from Clients or Insurers and the unwelcome scenario of having a design practice design to different suites of Standards for different materials. There may be some who find that the reduction in ultimate loads reported in previous Eurocode articles is an attraction.

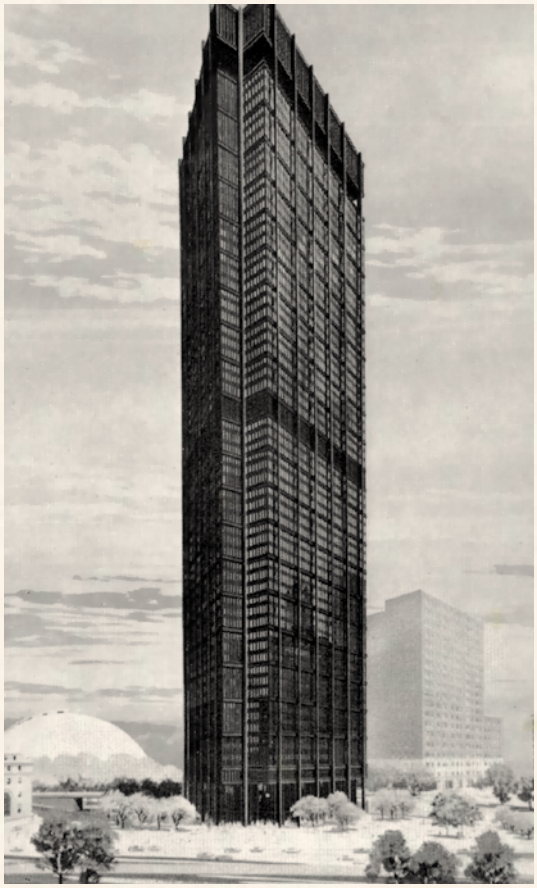
Although there has been a strong (and continuing) campaign to retain BS 5950, the sector has at the same time been preparing to facilitate the introduction of the Eurocodes, assuming demand from designers. A range of training is available and guides will be printed early in 2009 with software also available during the year.

40 Years Ago in

BUILDING WITH STEEL

An architectural expression of structural steelwork

with no conventional fireproofing



Above: The new United States Steel Office Building, to be completed in 1970.
Right: The exterior columns are connected to the main structure at every third floor, creating a series of 3-storey buildings, each with its own framing, resting on the column connections.

The bare and basic facts of this building are that it is triangular with 18 exposed supporting steel columns in weathering steel – six for each side – standing out three feet from the building wall. The core of the building is an equilateral triangle with sides 162 ft long. Inside the structure, which covers nearly an acre per floor, there are three rectangular office areas – resembling three separate structures sharing the same core. Each area is 221 ft long and 45 ft 6 in wide. There is a column free area of approximately 10,000 sq ft in each rectangular section.

The following statistics may be dull but they are singularly impressive – height of building will be 841 ft, single floor area 41,164 sq ft, gross area of building 2,900,000 sq ft, number of floors 64, lifts 54, elevators 9, windows 11,000.

Some of the innovations which are of interest to structural engineers are as follows:

Structural frame. The braced core works integrally with the exterior columns through a space frame (hat) at the top of the building which results in greater structural economy. The floors are attached to exterior columns every third floor, thus eliminating spandrel framing and heavy connections to these columns on two thirds of the floors. The two floors in between are supported by 2-storey high columns resting on the floors attached to the exterior columns.

Columns. Exterior Cor-Ten columns – 36 in deep, 24 in wide – are free of conventional fireproofing and are positioned 3 ft in front of the building wall, thus providing an architectural expression of steel structure. These box columns are

Right: Curtain walls for cladding the building will be constructed of weathering steel that turns to a deep russet colour when left exposed to the weather, and never needs painting.

Above: Artists conception shows how the heliport which is to be built at the top of the building may look. Designed for future possible use by vertical take-off aircraft, the heliport will be used initially by conventional helicopters.

fireproofed by filling with a treated water solution that circulates without mechanical aid if fire should occur. Approximately 500,000 gallons of fireproofing liquid will be in the columns.

These columns are divided into four vertical zones, each approximately 200 ft high. In each zone – containing the ¼ segments of each of the 18 columns – a piping system with inlets at the top of the chambers, outlets at the bottom, interconnects the columns and a 2,000 gallon treated water tank. Each zone contains 125,000 gallons of this liquid. Storage tanks are located on the 16th, 34th, 50th and 64th floors.

Exterior columns are being fabricated from Cor-Ten plate, varying in thickness from ¾ in to 4 in and with a high yield stress of 50,000 lb/sq in.

Modular system. The total modular (4 ft 4 in square) system with constant dimensions from the core wall to the outside wall, 45 ft 6 in (10½ modules) – together with related mechanical and electrical systems – provides the possibility of relocating partitions without altering lighting, air conditioning, architectural finishes or typical structural elements. For the office floors the floor-to-floor height is 11ft 10 in and the floor-to-ceiling height is 8 ft 6 in.

Exterior walls. Cor-Ten steel wall framing with horizontally pivoted stainless steel windows is to be used for the exterior wall. The vertical mullion will have a 5½ in depth and will frame the 6ft high by 2ft 4 in wide windows. The panel area between the vertical lines of windows will be 2 ft wide by 32 ft high. Each window and adjacent panel measures 4 ft 4 in which corresponds to the interior office module.

A very significant innovation comes under the heading 'Heliport'. Design is adequate to accommodate vertical take off aeroplanes in accordance with data furnished by aircraft companies. They indicate that these aircraft will be used in the next few years. Conventional helicopters will use the heliport in the meantime.

One of the architects of the building has stated that in collaboration with engineers, all types of plan form were studied and analysed before the triangular plan was finally adopted.

He says that the triangular plan is amazingly efficient as a structure, the form most fitting to the functional requirements of a major high rise building. The basic structural and wall elements are articulated clearly and produce an interesting play of form and shape, displaying the vitality of the structural system. "We feel we have a building which illustrates the excitement and glamour of steel."

Architects: Harrison & Abramovitz & Abbe;
Structural engineers: Worthington, Skilling, Helle & Jackson.

AD 330
Open top box girders for bridges

Recently there has been an increase in the use of 'open-top' boxes for the creation of composite box girder bridges. Typically, they are employed where the span is in excess of about 50 m and a pair of trapezoidal sections are used with a common deck slab, as shown in Figure 1. The open boxes are erected first and the slab is then cast in situ.

To stabilise the narrow top flanges during construction, cross bracing is provided at moderate spacing (4 to 7 m spacing). The guidance given in SCI publication P140 suggested that such bracing provided effective lateral restraint to the top flanges and that the effective length of the top flange (for lateral buckling) could be taken as 0.85 times the spacing of the bracing (considering the flange as a chord to a truss). However, this presumption relied on there being sufficient warping stiffness of the channel-like section to prevent an overall lateral torsional buckling developing before local buckling between bracings.

With the use of inclined flanges, the bottom flange of such box sections can be quite narrow and this means that the warping stiffness is quite low. Overall lateral torsional buckling, with a half wavelength equal to the span, can then occur, in the form shown in Figure 2. This can occur at relatively low loads (i.e. with only a small factor between the elastic critical load and the load at the wet concrete stage) and at a much lower load than would cause buckling of the top flanges between bracing positions. Even when there is sufficient factor between design load and elastic critical load, the low warping stiffness could permit significant twist, sufficient to allow unacceptable rotation at midspan (the slab surface would have an unacceptable transverse slope).

Figure 1 Typical cross section of an open-top composite box girder bridge

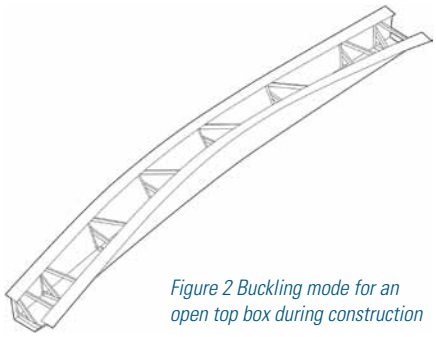


Figure 2 Buckling mode for an open top box during construction

Designers should therefore consider this mode of buckling during construction and determine its elastic critical buckling load. If the open top section is too sensitive to that mode of buckling, either a wider section should be used (although it may be impractical to choose a suitable geometry) or plan bracing should be provided at top flange level.

Plan bracing at or near top flange level creates a 'pseudo-box' and thus develops a torsional stiffness comparable to the St Venant torsional stiffness of a closed box. This torsional stiffness is much greater than the warping stiffness of the open section. However, plan bracing at top flange level is very inconvenient for slab construction (its presence conflicts with permanent formwork and the slab reinforcement). Bracing can be provided just below top flange level (and connected at cross bracing positions) but the designer must them consider its influence in the permanent condition. Such bracing will be stressed by overall bending of the composite box and, since the members are slender, they may tend to buckle in midspan regions, although such buckling is not critical (the contribution to bending resistance is not needed) and the load they carry will simply be shed. Perhaps more significantly, the fatigue effects at the connection of the bracing need to be considered. Alternatively, the plan bracing could be removed but this would require access inside the box and is very undesirable for health and safety reasons.

Plan bracing need not be provided along the whole length of a span. It may be sufficient to provide plan bracing at support regions and at midspan regions but in such cases further modes of buckling will need to be considered - a 3D elastic buckling analysis would be essential.

Contact: D C Iles
Tel: 01344 636525
Email: advisory@steel-sci.com

New and Revised Codes & Standards

(from BSI Updates December 2008 & January 2009)

BRITISH STANDARDS

NA to BS EN 1993:-
UK National Annex to Eurocode 3. Design of steel structures
NA to BS EN 1993-1-2:2005
General rules. Structural fire design
No current standard is superseded
NA to BS EN 1993-1-8:2005
Design of joints
No current standard is superseded

BRITISH STANDARDS REVIEWED AND CONFIRMED

BS 8100:-
Lattice towers and masts
BS 8100-2:1986
Guide to the background and use of Part 1 'Code of practice for loading'
BS 8100-3:1999
Code of practice for strength assessment of members of lattice towers and masts
BS 8100-4:1995
Code of practice for loading of guyed masts

NEW WORK STARTED

BS EN 14399:-
High-strength structural bolting assemblies for preloading
BS EN 14399-1:2005/Amendment 1
General requirements

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT

08/30167121 DC
BS EN ISO 14174 Welding consumables. Fluxes for submerged arc welding and electroslag welding. Classification

08/30167126 DC
BS EN ISO 14171 Welding consumables. Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of non alloy and fine grain steels. Classification

08/30177295 DC
BS ISO 14341 Welding consumables. Wire electrodes and deposits for gas shielded metal arc welding of non alloy and fine grain steels. Classification

SCI ALL SET TO EASE EUROCODE SWITCH

As the leading independent provider of technical expertise and disseminator of best practice to the steel work construction sector, engineering professionals rightly look to SCI for the latest publications to ease the transition to the Eurocodes. As such, we are forging ahead by publishing a full suite of 12 Eurocode publications by June 2009.

The first to be published will be:

P361 Steel building design: Introduction to the Eurocodes. This flagship book offers a vital introduction to the ten Structural Eurocodes and the format that is used. It also explains the relationship between the Eurocodes, their National Annexes and non-contradictory complementary information (NCCI). Further sections explain basis of structural design, actions (loads), design of steel structures, and design of composite structure.

The next two books for publication will be:

P363 Steel building design: Design data (SCI/BCSA Eurocode Blue Book). This publication is the Eurocode version of the famous 'SCI/BCSA Blue Book'. The presentation is in accordance with the Eurocode, and the resistances are presented in a form for direct use.

P365 Steel building design: Medium rise braced frames. This publication covers the design of braced steel-framed medium rise buildings, offers guidance on the structural design of the superstructure and general advice on such issues. It refers to the Structural Eurocodes, which are due to replace BS 5950.

All of SCI's publications can be purchased in the following ways:
Online: www.shop.steelbiz.org **Email:** publications@steel-sci.com
Telephone Publications Sales: +44 (0)1344 636 505

The British Constructional Steelwork Association Ltd

You can find email and website addresses for all these companies at www.steelconstruction.org

BCSA is the national organisation for the steel construction industry. Details of BCSA membership and services can be obtained from Gillian Mitchell MBE, Deputy Directory General, BCSA, 4 Whitehall Court, London SW1A 2ES
Tel: 020 7839 8566 Email: gillian.mitchell@steelconstruction.org

KEY

Categories

- **A** All forms of building steelwork
- **B*** Bridgework
- **C** Heavy industrial plant structures
- **D** High rise buildings
- **E** Large span portals
- **F** Medium/small span portals and medium rise buildings
- **H** Large span trusswork
- **J** Major tubular steelwork
- **K** Towers
- **L** Architectural metalwork
- **M** Frames for machinery, supports for conveyors, ladders and catwalks
- **N** Grandstands and stadia
- **S** Small fabrications
- **Q** Specialist fabrication services

Quality Assurance Certification

- **Q1** Steel Construction Certification Scheme Ltd
- **Q2** BSI
- **Q3** Lloyds
- **Q4** Other

Classification Contract Value

- **10** Up to £40,000
- **9** Up to £100,000
- **8** Up to £200,000
- **7** Up to £400,000
- **6** Up to £800,000
- **5** Up to £1,400,000
- **4** Up to £2,000,000
- **3** Up to £3,000,000
- **2** Up to £4,000,000
- **1** Up to £6,000,000
- **0** Above £6,000,000

Notes

1. Applicants may be registered in one or more categories to undertake the fabrication and the responsibility for any design and erection of the above.
2. Where an asterisk (*) appears against any company's classification number, this indicates that the assets required for this classification are those of the parent company.
- * For details of bridgework subcategories contact Gillian Mitchell at the BCSA.

ACL STUCTURES LTD (E F H M 3)
Holland Way Ind. Est., Blandford, Dorset DT11 7TA
Tel 01258 456051 Fax 01258 450566

ASA STEEL STRUCTURES LTD (E F H L M S 6*)
Brick Kiln Lane, Parkhouse Ind. Est. West, Newcastle-under-Lyme, Staffs ST5 7EF
Tel 01782 566366 Fax 01782 564785

ASD WESTOK LTD (Q 1)
Horbury Junction Ind Est, Horbury Junction, Wakefield WF4 5ER
Tel 01924 264121 Fax 01924 280030

ASME ENGINEERING LTD (Q4)
Asme House, 788 Kenton Lane, Harrow, Middlesex HA3 6AG
Tel 0208 954 0028 Fax 0208 954 0036

AWF STEEL LTD (F L S 9)
21 Lenziemill Rd, Lenziemill, Cumbernauld G67 2RL
Tel 01236 457960 Fax 01236 452250

ADEY STEEL LTD (F H J L M 3)
Falcon Industrial Park, Meadow Lane, Loughborough, Leics LE11 1HL
Tel 01509 556677 Fax 01509 828639

ADSTONE CONSTRUCTION LTD (E F 2)
Adstone House, Wassage Way, Hampton Lovett Industrial Estate, Droitwich WR9 9NX
Tel 01905 794561 Fax 01905 794040

ADVANCED FABRICATIONS POYLE LTD (F J H J K L M 7 Q4)
772-775 Buckingham Avenue, Slough, Berkshire SL1 4NL
Tel 01753 531116 Fax 01753 531120

ALLERTON ENGINEERING LTD (B 5* Q3)
Allerton House, Thurston Road, Northallerton, N. Yorkshire DL6 2NA
Tel 01609 774471 Fax 01609 780364

ANDREW MANNION STRUCTURAL ENGINEERS LTD (D E F H J M N 1 Q4)
Clara Road, Moatee, Co Westmeath, Republic of Ireland
Tel 00 353 90 648 1184 Fax 00 353 90 648 1735

THE ANGLE RING CO LTD
Bloomfield Road, Tipton DY4 9EH
Tel 0121-557 7241 Fax 0121-522 4555

APEX STEEL STRUCTURES LTD (F H L M 6)
Kings Close, Charfleets Industrial Estate, Canvey Island, Essex SS8 0QZ
Tel 01268 660 828 Fax 01268 660 829

ARROMAX STRUCTURES LTD (C D E F H J K L M 6)
Langwith Junction, Mansfield, Notts NG20 9RN
Tel 01623 747466 Fax 01623 748197

ATLAS WARD STRUCTURES LTD (A 0 Q1)
Sherburn, Malton, N. Yorkshire YO17 8PZ
Tel 01944 710421 Fax 01944 710512

ATLASCO CONSTRUCTIONAL ENGINEERS LTD (E F H 4)
Rowhurst Industrial Estate, Apedale, Chesterton, Newcastle-U-Lyme ST5 6BD
Tel 01782 564711 Fax 01782 564591

B D STRUCTURES LTD (E F H M 5)
Westhoughton Ind Est, James St, Westhoughton, Lancs, BL5 3QR
Tel 01942 817770 Fax 01942 810438

BHC LTD (C D E F H 0)
Edinburgh Road, Carnwath, Lanarkshire ML11 8LG
Tel 01555 840006 Fax 01555 840036

BSB STRUCTURAL LTD (E F 6)
Whitecross Industry Park, Whitecross, Nr Linlithgow, West Lothian EH49 6LH
Tel 01506 840937 Fax 01506 840932

A. C. BACON ENGINEERING LTD (E F H 5)
Norwich Rd, Hingham, Norwich NR9 4LS
Tel 01953 850611 Fax 01953 851445

BALLYKINE STRUCTURAL ENGINEERS LTD (E F H J N 4 Q2)
51 Lisburn Rd, Ballynahinch, Co Down BT24 8TT
Tel 028 9756 2560 Fax 028 9756 2751

BARNSHAW SECTION BENDERS LTD (Q 6 Q2)
Structural Division, Anchor Lane, Coseley, Bilston, West Midlands WV14 9NE
Tel 01902 880848 Fax 01902 880125

BARRETT STEEL BUILDINGS LTD (E F H 1 Q1)
Barrett Court, Cutler Heights Lane, Dudley Hill, Bradford BD4 9HZ
Tel 01274 266800 Fax 01274 266860

BARRETTS OF ASPLEY LTD (F L M 3)
North Common Farm, Woburn Road, Lidlington, Bedfordshire MK43 0NN
Tel 01525 280136 Fax 01525 280137

BILLINGTON STRUCTURES LTD (A 0 Q1)
Barnsley Road, Wombwell S73 8DS
Tel 01226 340666 Fax 01226 755947

BONE STEEL LTD (D E F H L N 1*)
P.O. Box 9300, Wishaw, Lanarkshire ML2 0YA
Tel 01698 375000 Fax 01698 372727

F J BOOTH & PARTNERS LTD (E F H M S 2 Q2)
Dockside Road, Middlesbrough, Cleveland TS3 8AT
Tel 01642 241581 Fax 01642 223398

BORDER STEELWORK STRUCTURES LTD (C E F H 4)
Winchester House, 58 Warwick Rd, Carlisle CA1 1DR
Tel 01228 548744 Fax 01228 511073

BOURNE CONSTRUCTION ENGINEERING LTD (A 0 Q2)
St Clements House, St Clements Rd, Poole, Dorset BH12 4GP
Tel 01202 746666 Fax 01202 732002

W.S BRITLAND & CO. LTD (Q2)
Tilmanstone Works, Pike Road, Eythorne, Dover CT15 4NB
Tel 01304 831583 Fax 01304 831983

BRITON FABRICATORS LTD (B 4 Q4)
Watnall Road, Hucknall, Notts NG15 6EP
Tel 0115 963 2901 Fax 0115 968 0335

BROWNE STRUCTURES LTD (F J S 7)
Queens Drive, Newhall, Swadlincote, Derbyshire DE11 0EG
Tel 01283 212720 Fax 01283 215033

BUTTERLEY LTD (Q4)
Ripley, Derby DE5 3BQ.
Tel 01773 573573 Fax 01773 749898

CMF LTD (F H J L M S 1)
Central Way, Feltham TW14 0XJ
Tel 020 8844 0940 Fax 020 8751 5793

CAIRNHILL STRUCTURES LTD (C F H J L M 5 Q4)
Sun Works, Waverley Street, Coatbridge, Lanarkshire ML5 2BE
Tel 01236 449393 Fax 01236 428328

CAUNTON ENGINEERING LTD (C E F H J M N 1 Q1)
Moorgreen Ind. Park, Moorgreen, Nottingham NG16 3QU
Tel 01773 531111 Fax 01773 532020

CHIEFTAIN CONTRACTS LTD (E F S 7)
Antonine Works, Broomhill Road, Bonnybridge FK4 2AL
Tel 01324 812911 Fax 01324 814927

CLEVELAND BRIDGE UK LTD (A B 0* Q3)
Cleveland House, Yarm Rd, Darlington, Co Durham DL1 4DE
Tel 01325 381188 Fax 01325 382320

COMPASS ENGINEERING LTD (C E F H K 4)
Whaley Road, Barugh, Barnsley S75 1HT
Tel 01226 298388 Fax 01226 283215

CONDER STRUCTURES LTD (D E F H M N S 1 Q2)
Wellington Rd, Burton-on-Trent, Staffs DE14 2AA
Tel 01283 545377 Fax 01283 530483

LEONARD COOPER LTD (C F H K M 6 Q1)
Balm Road, Hunslet, Leeds LS10 2JR
Tel 0113 270 5441 Fax 0113 276 0659

CORDELL GROUP LTD (C F H J K L M 3 Q4)
Sotherby Road, Skippers Lane Industrial Estate, South Bank, Middlesborough TS6 6LP
Tel 01642 452406 Fax 01642 464118

COVENTRY CONSTRUCTION LTD (E F H L M S 5)
Torrington Avenue, Coventry CV4 9AP
Tel 024 7646 4484 Fax 024 7669 4020

CRONIN BUCKLEY FABRICATION & CONSTRUCTION LTD (E F H M 1)
Killumney, Ovens, Co Cork, Republic of Ireland
Tel: 00 353 214 870 017 Fax: 00 353 214 872 890

CROWN STRUCTURAL ENGINEERING LTD (E F H K M 5 Q1)
Burma Rd, Blidworth, Mansfield, Notts NG21 0RT
Tel 01623 490555 Fax 01623 490666

D H STRUCTURES LTD (F M 8)
Tollgate Drive, Tollgate Industrial Estate, Beaconside, Stafford ST16 3HS
Tel 01785 246269 Fax 01785 222077

FRANK H DALE LTD (D E F 1 Q4)
Mill Street, Leominster, Herefordshire HR6 8EF
Tel 01568 612212 Fax 01568 619401

DISCAIN PROJECT SERVICES LTD (F L M S 5 Q1)
Hartburn Close, Crow Lane Industrial Estate, Northampton NN3 9UE
Tel 01604 787276 Fax 01604 407290

DUGGAN STEEL LTD (D E F H J M 1)
The Square, Millstreet, Co Cork, Republic of Ireland
Tel 00 353 29 70072 Fax 00 353 29 70073

ELLAND STEEL STRUCTURES LTD (A 1 Q1)
Philmar House, Gibbet St, Halifax HX2 0AR
Tel 01422 380262 Fax 01422 380263

ELSOME STRUCTURES LTD (F L M 6*)
Welby Road, Asfordby Hill, Melton Mowbray, Leicestershire LE14 3RD
Tel: 01664 813234 Fax: 01664 813341

EMMETT FABRICATIONS LTD (E F H 6)
Hirst Wood Works, Hirst Wood Road, Shipley BD18 4BU
Tel 01274 597484 Fax 01274 588671

EVADX LTD (A 3 Q4)
Unit 9, Tir Llywd Enterprise Park, St. Asaph Avenue, Kinmel Bay, Rhyl LL18 5JZ
Tel 01745 336413 Fax 01745 339639

FAIRFIELD-MABEY LTD (A B 0 Q4)
Chepstow, Monmouthshire NP16 5YL
Tel 01291 623801 Fax 01291 625453

FISHER ENGINEERING LTD (A 1 Q1)
Ballinamallard, Enniskillen, Co Fermanagh BT94 2FY
Tel 028 6638 8521 Fax 028 6638 8706

FOX BROS ENGINEERING LTD (E F H J M 3)
Ballycanew, Gorey, Co Wexford, Republic of Ireland
Tel 00 353 53 942 1677 Fax 00 353 53 942 1733

GME STRUCTURES LTD (E F H J L M S 6)
Unit E11-E14, Wem Industrial Estate, Soulton Road, Wem, Shropshire SY4 5SD
Tel 01939 233023 Fax 01939 234059

GIBBS ENGINEERING LTD (F H J L M 6 Q4)
17A Axe Road, Colley Lane Industrial Estate, Bridgwater, Somerset TA6 5LP
Tel 01278 455253 Fax 01278 453174

GLENTWORTH FABRICATIONS LTD (F J K L M N S 6)
Molly Millar's Bridge, Molly Millar's Lane, Wokingham RG41 2WY
Tel 0118 977 2088 Fax 0118 977 2907

GORGE FABRICATIONS LTD (F H J L 5)
Gorge House, Great Bridge Industrial Estate, Toll End Road, Tipton, West Midlands DY4 0HR
Tel 0121 522 5770 Fax 0121 557 0415

GRAHAM WOOD STRUCTURAL LTD (A 1)
Lancing Business Park, Chartwell Road, Lancing BN15 8TY
Tel 01903 755991 Fax 01903 755384

GRAYS ENGINEERING (CONTRACTS) LTD (F J L M 8)
Globe Industrial Estate, Rectory Road, Grays, Essex RM17 6ST
Tel 01375 372411 Fax 01375 375079

D A GREEN & SONS LTD (A 1 Q1)
Whaplode, Spalding, Lincs PE12 6TL
Tel 01406 370585 Fax 01406 370766

GREGG & PATTERSON (ENGINEERS) LTD (E F H J N 2 Q4)
Riverside Works, Ballyskeagh Road, Lambeg, Co Antrim BT27 5TD
Tel 028 9061 8131 Fax 028 9062 2813

HAD-FAB LTD (K M S 5 Q4)
Macmerry Ind. Est., Tranent, East Lothian EH33 1RD
Tel 01875 611711 Fax 01875 612711

WILLIAM HALEY ENGINEERING LTD (E F K M 4 Q1)
Bellcombe Works, East Brent, nr. Highbridge, Somerset TA9 4DB
Tel 01278 760591 Fax 01278 760587

HAMBLETON STEEL LTD (D E F H J N 1 Q1)
Gatherley Road, Brompton-on-Swale, Richmond, North Yorkshire DL10 7JH
Tel 01748 810598 Fax 01748 810601

WILLIAM HARE LTD (A 0 Q1)
Brandlesholme House, Brandlesholme Rd, Bury, BL8 1JJ
Tel 0161 609 0000 Fax 0161 609 0409

M. HASSON & SONS LTD (E F H J K L M S 3 Q1)
17 Glebe Rd, Rasharkin, Co. Antrim BT44 8SS
Tel 028 2957 1281 Fax 028 2957 1575

HENRY SMITH (CONSTRUCTIONAL ENGINEERS) LTD (C D E F H J 2)
Wharton Steelworks, Winsford CW7 3BW
Tel 01606 592121 Fax 01606 559134

HESCOTT ENGINEERING CO LTD (E F H L S 3)
Lochlands Viaduct, Larbert, Stirlingshire FK5 3NN
Tel 01324 556610 Fax 01324 552970

HILLS OF SHOEBURYNESS LTD (L M S 6)
17-19 Towerfield Road, Shoeburyness, Essex SS3 9QL
Tel 01702 296321 Fax 01702 297072

JAMES BROS (HAMWORTHY) LTD (E F H M 5 Q4)
Stanley House, 3 Fleets Lane, Poole, Dorset BH15 3AJ
Tel 01202 673815 Fax 01202 684033

JAMES KILLELEA & CO LTD (C D E F H N 1*)
Stoneholme Road, Crawshawbooth, Rossendale, Lancs BB4 8BA
Tel 01706 229411 Fax 01706 228388

LEACH STRUCTURAL STEELWORK LTD (C E F H J M 5)
Brockholes Way, Claughton-on-Brock, nr Preston PR3 0PZ
Tel 01995 640133 Fax 01995 640719

LEONARD ENGINEERING (BALLYBAY) LTD (E F H M 3)
St Patrick's Street, Ballybay, Co Monaghan, Republic of Ireland
Tel 00 353 42 974 1099 Fax 00 353 42 974 1001

LOWE ENGINEERING (MIDLAND) LTD (L S 6 Q4)
Bramshall Industrial Estate, Stone Road, Bramshall, Staffs ST14 8SH
Tel 01889 563244 Fax 01889 563554

M&S ENGINEERING LTD (F K L M S 5)
East Road, Lowthertown, Eastriggs DG12 6TD
Tel 01461 40111 Fax 01461 40542

TERENCE MCCORMACK LTD (E F H J 6 Q1)
17 Camlough Rd, Newry BT35 6JS
Tel 028 3026 2261 Fax 028 3026 8177

MALDON MARINE LTD (F J K L 5)
Unit 16, West Station Ind. Est., Spital Road, Maldon, Essex CM9 6TW
Tel 01621 859000 Fax 01621 858935

HARRY MARSH (ENGINEERS) LTD (E F H M N 4)
The Parade, Hendon, Sunderland SR2 8LT
Tel 0191 510 9797 Fax 0191 510 9798

PETER MARSHALL (FIRE ESCAPES) LTD (L M 6)
Lincoln House, Branch End, Gelderd Road, Leeds LS27 7LL
Tel: 0113 307 6730 Fax: 0113 307 5968

MIDLAND STEEL STRUCTURES LTD (E F H 6)
Golden Acres Lane, Binley, Coventry CV3 2RT
Tel 024 7644 5584 Fax 024 7645 9995

MIFFLIN CONSTRUCTION LTD (D E F H M 3)
Worcester Rd, Leominster, Herefordshire HR6 8AY
Tel 01568 613311 Fax 01568 614935

MILLTOWN ENGINEERING LTD (E F H J 1)
Garryhill, Bagenalstown, Co Carlow, Republic of Ireland
Tel 00 353 59 972 7119 Fax 00 353 59 972 7202

NEWBRIDGE ENGINEERING LTD (E F H 5 Q4)
Tees Bay Business Park, Brenda Rd, Hartlepool TS25 2BU
Tel 01429 866722 Fax 01429 869811

NEWTON FABRICATIONS LTD (E F L M N S 2 Q4)
9 York Street, Ayr, Ayrshire KA8 8AN
Tel 01292 269135 Fax 01292 610258

NUSTEEL STRUCTURES LTD (B H J K L 4* Q1)
Lympne, Hythe, Kent CT21 4LR
Tel 01303 268112 Fax 01303 266098

ON SITE SERVICES (GRAVESEND) LTD (F H J L M S 7)
Wharf Road, Denton, Gravesend, Kent DA12 2RU
Tel 01474 321552 Fax 01474 357778

OVERDALE CONSTRUCTION SERVICES LTD (E F H J M S 6)
Millers Avenue, Brynmenyn Industrial Estate, Bridgend CF32 9TD
Tel 01656 729229 Fax 01656 722101

PMS FABRICATIONS LTD (E F H L S 5)
Thomas Lane, Burgh Road Industrial Estate, Carlisle, Cumbria CA2 7NA
Tel 01228 599090 Fax 01228 599091

HARRY PEERS STEELWORK LTD (C E F H J K L M 2 Q1)
Elton St, Mill Hill, Bolton BL2 2BS
Tel 01204 528393 Fax 01204 362363

PENCRO STRUCTURAL ENGINEERS LTD (E F H J M 4 Q4)
Orpinsmill Road, Ballyclare, Co. Antrim BT39 0SX
Tel 028 9335 2886 Fax 028 9332 4117

RSL (SOUTH WEST) LTD (E F H M 5)
Millfield Industrial Est., Chard, Somerset TA20 2BB
Tel 01460 67373 Fax 01460 61669

JOHN REID & SONS (STRUCSTEEL) LTD (A 1)
296-298 Reid Sreet, Christchurch BH23 2BT
Tel 01202 483333 Fax 01202 499763

REMNANT ENGINEERING LTD (B F H J L S 7* Q4)
Unit 161, Lydney Industrial Estate, Harbour Road, Lydney, Gloucestershire GL15 4EJ
Tel 01594 841160 Fax 01594 843208

RIPPIN LTD (E F H J 4)
Thistle Ind. Est., Church Street, Cowdenbeath KY4 8LP
Tel 01383 518610 Fax 01383 513099

ROBERTS ENGINEERING (F L S 9)
16D Bergen Way, Sutton Fields Ind. Est., Hull HU7 0YQ
Tel 01482 838240 Fax 01482 830697

J. ROBERTSON & CO LTD (L M S 8)
Mill Lane, Walton-on-Naze CO14 8PE
Tel 01255 672855 Fax 01255 850487

ROBINSON CONSTRUCTION (C D E F H 0 Q1)
Wincanton Close, Ascot Drive,
Industrial Estate, Derby DE24 8NJ
Tel 01332 574711 Fax 01332 861401

ROWECORD ENGINEERING LTD (A B 0 Q1)
Neptune Works, Uskway, Newport, South Wales NP20 2SS
Tel 01633 250511 Fax 01633 253219

ROWEN STRUCTURES LTD (A 0*)
17 Maisies Way, The Village, South Normanton,
Derbyshire DE55 2DS
Tel: 01773 860086 Fax: 01773 814077

S H STRUCTURES LTD (H J K L 3)
Moor Lane Trading Estate, Sherburn-in-Elmet,
North Yorkshire LS25 6ES
Tel 01977 681931 Fax 01977 681930

SELWYN CONSTRUCTION ENGINEERING LTD (L M S 8 Q4)
Tarron Road, Tarron Industrial Estate,
Moreton, Wirral CH46 4TU
Tel 0151 678 0236 Fax 0151 678 8959

SEVERFIELD-REEVE STRUCTURES LTD (A 0 Q2)
Dalton Airfield Industrial Estate, Dalton,
Thirsk, North Yorkshire YO7 3JN
Tel 01845 577896 Fax 01845 577411

SHIPLEY FABRICATIONS LTD (E F H K L M S 8)
Maddocks Park, Ancaster, Grantham, Lincs NG32 3RT
Tel 01400 231115 Fax 01400 231220

SIAC BUTLERS STEEL LTD (D E F H J M N 0 Q4)
Lea Road, Portarlington, Co Laois, Republic of Ireland
Tel 00 353 57 8623305 Fax 00 353 57 8623207

SIAC TETBURY STEEL LTD (D E F H 3 Q1)
London Rd, Tetbury, Gloucs GL8 8HH
Tel 01666 502792 Fax 01666 504246

SNASHALL STEEL FABRICATIONS CO LTD (E F H S 4)
Pulham Business Park, Pulham, nr Dorchester, Dorset DT2 7DX
Tel 01300 345588 Fax 01300 345533

SOUTH DURHAM STRUCTURES LTD (E F L M N S 6)
South Church Enterprise Pk, Dovecot Hill,
Bishop Auckland, Co. Durham DL14 6XR
Tel 01388 777350 Fax 01388 775225

W & H STEEL & ROOFING SYSTEMS LTD (E F H J 2)
Kilkenny Road, Castlecomer, Co Kilkenny, Republic of Ireland
Tel 00 353 56 444 1855 Fax 00 353 56 444 1860

THE AA GROUP LTD (C D E F H M 5)
Priorswood Place, East Pimbo, Skelmersdale, Lancs WN8 9QB
Tel 01695 50123 Fax 01695 50133

THE STEEL PEOPLE LTD (F L S 9)
Unit 3E, Priory Park, Mills Road, Aylesford, Kent ME20 7PP
Tel 01622 715900 Fax 01622 715905

TRADITIONAL STRUCTURES LTD (D E F H J K M N 3* Q1)
Findel Works, Landywood Lane, Cheslyn Hay,
Walsall, West Midlands WS6 7AJ
Tel 01922 414172 Fax 01922 410211

PADDY WALL & SONS (E F H J 1 Q4)
Waterford Road Business Park,Waterford Road,
New Ross, Co Wexford, Republic of Ireland
Tel 00 353 51 420 515 Fax 00 353 51 420 516

WALTER WATSON LTD (E F H J N 1 Q4)
Greenfield Works, Ballylough Rd, Castlewellan,
Co Down BT31 9JQ
Tel 028 4377 8711 Fax 028 4377 2050

WATSON STEEL STRUCTURES LTD (A B 0 Q1)
Lostock Lane, Bolton BL6 4BL
Tel 01204 699999 Fax 01204 694543

WESTBURY PARK ENGINEERING LTD (F J K L M Q4)
Brook Lane, Westbury, Wilts BA13 4ES
Tel 01373 825500 Fax 01373 825511

WIG ENGINEERING LTD (F L 7)
Barnfield, Akeman Street, Chesterton, Oxon OX26 1TE
Tel 01869 320515 Fax 01869 320513

H. YOUNG STRUCTURES LTD (E F H J M 4)
Ayton Road, Wymondham, Norfolk NR18 0RD
Tel 01953 601881 Fax 01953 607842

ASSOCIATE MEMBERS

STRUCTURAL COMPONENTS

ALBION SECTIONS LTD (Q4)
Albion Rd, West Bromwich,West Midlands B70 8BD
Tel 0121 553 1877 Fax 0121 553 5507

AYRSHIRE METAL PRODUCTS (DAVENTRY) LTD (Q2)
Royal Oak Way, Daventry NN11 5NR
Tel 01327 300990 Fax 01327 300885

BARNSHAW PLATE BENDING CENTRE LTD (Q2)
Corporation Rd, Audenshaw, Manchester M34 5LR
Tel 0161 320 9696 Fax 0161 335 0918

CELLBEAM LTD
Unit 516, Thorp Arch Estate, Wetherby,
West Yorkshire LS23 7DB
Tel 01937 840614 Fax 01937 840608

COMPOSITE METAL FLOORING LTD
Unit 3, Mamhilad Technology Park, Old Abergavenny Road,
Mamhilad NP4 0JJ
Tel 01495 761080

COMPOSITE PROFILES UK LTD
15 Moor Road, Broadstone, Dorset BH18 8AZ
Tel 01202 659237 Fax 01202 659288

CORUS PANELS & PROFILES (Q1)
Severn Drive, Tewkesbury Business Park,
Tewksbury, Glos GL20 8TX
Tel 01684 856600 Fax 01684 856601

DAVER STEELS LTD
395 Petre Street, Sheffield S4 8LN
Tel: 0114 261 1999 Fax: 0114 261 1888

FLI STRUCTURES
Waterwells Drive, Waterwells Business Park,
Gloucester GL2 2AA
Tel 01452 722200 Fax 01452 722244

FABSEC LTD
1st Floor, Unit 3, Calder Close,
Calder Business Park, Wakefield WF4 3BA
Tel 0845 094 2530 Fax 0845 094 2533

HI-SPAN LTD
Ayton Rd, Wymondham NR18 0RD
Tel 01953 603081 Fax 01953 607842

KINGSPAN STRUCTURAL PRODUCTS (Q4)
Sherburn, Malton, N. Yorkshire YO17 8PQ
Tel 01944 712000 Fax 01944 710555

RICHARD LEES STEEL DECKING LTD
Moor Farm Rd West, The Airfield, Ashbourne,
Derbyshire DE6 1HD
Tel 01335 300999 Fax 01335 300888

MSW STRUCTURAL FLOOR SYSTEMS
Acton Grove, Long Eaton, Nottingham NG10 1FY
Tel 0115 946 2316 Fax 0115 946 2278

MSW (UK) LTD
16 Jacobean House, 1 Glebe Street, East Kilbride G74 7LY
Tel 01355 232266 Fax 01355 266766

METSEC PLC (Q2)
Broadwell Rd, Oldbury, West Mids B69 4HE
Tel 0121 601 6000 Fax 0121 601 6181

NORTHERN STEEL DECKING LTD
Aston House, Campbell Way, Dinnington, Sheffield S25 3QD
Tel 01909 550054 Fax 01909 569443

NORTHERN STEEL DECKING SCOTLAND LTD
23 Mary Street, Johnston, Renfrewshire, PA5 8BT
Tel 01505 328830 Fax 01505 331201

PP PROTUBE LTD
Bay 6, Bold Industrial Park, Neills Road,
Bold, St Helens WA9 4TU
Tel 01744 818992 Fax 01744 820179

SCHOCK LTD
Barford Road, Bloxham, Banbury, Oxon OX15 4FF
Tel 0845 241 3390 Fax 0845 241 3391

STRUCTURAL METAL DECKS LTD
The Outlook, Ling Road, Tower Park, Poole, Dorset BH12 4PY
Tel 01202 718898 Fax 01202 714980

STRUCTURAL SECTIONS LTD (Q1)
123 West Bromwich Street, Oldbury, West Midlands B69 3AZ
Tel 0121 555 1342 Fax 0121 555 1341

STUDWELDERS LTD
Millennium Hse, Severn Link Distribution Centre, Newhouse Farm
Ind Est, Chepstow, Monmouthshire NP16 6UN
Tel 01291 626048 Fax 01291 629979

COMPUTER SOFTWARE

ACECAD SOFTWARE LTD
Truro House, Stephensons Way,
Wyvern Business Park, Derby DE21 6LY
Tel 01332 545800 Fax 01332 545801

BENTLEY SYSTEMS (UK) LTD
4 Woodside Place, Glasgow G3 7QF
Tel 0141 353 5168 Fax 0141 353 5112

COMPUTER SERVICES CONSULTANTS (UK) LTD
Yeadon House, New St, Pudsey, Leeds, LS28 8AQ
Tel 0113 239 3000 Fax 0113 236 0546

STEEL PROJECTS UK LTD
6 Highfield Drive, Gildersome, Leeds LS27 7DW
Tel: 0113 253 2171 Fax: 0113 252 8781

TEKLA (UK) LTD
Tekla House, Cliffe Park Way, Morley, Leeds LS27 0RY
Tel 0113 307 1200 Fax 0113 307 1201

DESIGN SERVICES

ARRO-CAD LTD
Bretby Business Park, Ashby Road,
Bretby, Burton-on-Trent DE15 0YZ
Tel 01283 558206 Fax 01283 558207

DEVELOPMENT DESIGN DETAILING SERVICES LTD
171 Bradshawgate, Bolton, Lancs BL2 1BH
Tel 01204 396606 Fax 01204 396634

STEEL PRODUCERS

CORUS
Frodingham House, PO Box 1,
Brigg Road, Scunthorpe DN16 1BP
Tel 01724 404040 Fax 01724 404229

CORUS TUBES
PO Box 101, Weldon Rd, Corby, Northants NN17 5UA
Tel 01536 402121

MANUFACTURING EQUIPMENT

FICEP (UK) LTD
10 The Courtyards, Victoria Park,
Victoria Road, Leeds LS14 2LB
Tel 0113 265 3921 Fax 0113 265 3913

KALTENBACH LTD
6-8 Brunel Road, Bedford MK41 9TJ
Tel 01234 213201 Fax 01234 351226

PEDDINGHAUS CORPORATION UK LTD
Unit 6, Queensway Link, Stafford Park 17, Telford TF3 3DN
Tel 01952 200377 Fax 01952 292877

PEDDINGHAUS CORPORATION UK LTD
Lockstown, Valleymount, Co Wicklow, Republic of Ireland
Tel 00 353 87 2577 884 Fax 00 353 45 867 028

RÖSLER UK
Unity Grove, Knowsley Business Park,
Prescot, Merseyside L34 9GT
Tel 0151 482 0444 Fax 0151 482 4444

VOORTMAN UK LTD
Unit 5, Mercian Park, Felspar Rd,
Amington Rd, Tamworth B77 4DP
Tel 01827 63300 Fax 01827 65565

PROTECTIVE SYSTEMS

FORWARD PROTECTIVE COATINGS LTD
Vernon St., Shirebrook, Mansfield, Notts NG20 8SS
Tel 01623 748323 Fax 01623 748730

HEMPEL UK LTD
Llantarnam Park, Cwmbran, Gwent NP44 3XF
Tel: 01633 874024 Fax: 01633 489089

INDUSTRIAL SHOTBLAST & SPRAYING LTD
Unit 7, Tetbury Industrial Esatate, Cirencester Road,
Tetbury, Gloucestershire GL8 8EZ
Tel 0845 130 6715 Fax 0845 130 6716

INTERNATIONAL PAINT LTD
Protective Coatings, Stoneygate Lane,
Felling, Gateshead NE10 0JY
Tel 0191 469 6111 Fax 0191 495 0676

LEIGHS PAINTS
Tower Works, Kestor Street, Bolton BL2 2AL
Tel 01204 521771 Fax 01204 382115

PPG PERFORMANCE COATINGS UK LTD
Micro House, Station Approach, Wood Street North,
Alfreton, Derbyshire DE55 7JR
Tel: 01773 837300 Fax: 01773 837302

SITE COAT SERVICES LTD
Unit 11, Old Wharf Road, Grantham, Lincolnshire NG31 7AA
Tel 01476 577473 Fax 01476 577642

JACK TIGHE LTD
Kirk Sandall Ind. Est., Kirk Sandall, Doncaster DN3 1QR
Tel 01302 880360 Fax 01302 880370

WEDGE GROUP GALVANIZING
c/o Worksop Galvanizing Claylands Avenue,
Worksop, Notts S81 7BQ
Tel 01909 486384 Fax 01909 482540

WELLS PROTECTIVE COATINGS LTD
Unit 21, Wright Business Park, Carr Hill, Doncaster DN4 8DE
Tel 01302 733611 Fax 01302 733639

SAFETY SYSTEMS

CELLSHIELD LTD
Unit 516, Thorp Arch Estate, Wetherby, West Yorkshire LS23 7DB
Tel 01937 840600 Fax 01937 840601

COMBISAFE INTERNATIONAL LTD
Unit 1, Zone A, Cheaney Drive, Grange Park,
Northampton NN4 5FB
Tel 01604 660600 Fax 01604 662960

EASI-EDGE LTD
Ollerton Rd, Tuxford, Newark, Notts NG22 0PQ
Tel 01777 870901 Fax 01777 872047

TRAILERPAL LTD
Cartmel Drive, Harlescott Industrial Estate,
Shrewsbury, Shropshire SY1 3TB
Tel 01743 446666 Fax 01743 442448

STEEL STOCKHOLDERS

ADVANCED STEEL SERVICES LTD
South Ribble Industrial Estate, Capitol Way,
Preston, Lancs PR5 4AJ
Tel 01772 259822 Fax 01772 259561

ALTERNATIVE STEEL CO LTD
Dobson Park Way, Ince, Wigan WN2 2DY
Tel 01942 610601 Fax 01942 821999

ASD METAL SERVICES – EDINBURGH
24 South Gyle Crescent, Edinburgh EH12 9EB
Tel 0131 459 3200 Fax 0131 459 3266

ASD METAL SERVICES – BODMIN
Unit 13, Cooksland Ind. Est., Bodmin, Cornwall PL31 2PZ
Tel 01208 77066 Fax 01208 77416

ASD METAL SERVICES – LONDON
Thames Wharf, Dock Road, London E16 1AF
Tel 020 7476 9444 Fax 020 7476 0239

ASD METAL SERVICES – CARLISLE
Unit C, Earls Way, Kingsmoor Park Central,
Kingstown, Cumbria CA6 4SE
Tel 01228 674766 Fax 01228 674197

ASD METAL SERVICES – HULL
Gibson Lane, Melton, North Ferriby, E. Yorkshire HU14 3HX
Tel 01482 633360 Fax 01482 633370

ASD METAL SERVICES – GRIMSBY
Estate Road No. 5, South Humberside Industrial Estate,
Grimsby DN31 2TX
Tel 01472 353851 Fax 01472 240028

ASD METAL SERVICES – BIDDULPH
PO Box 2, Tunstall Road, Biddulph, Stoke-on-Trent, Staffs ST8 6JZ
Tel 01782 515152 Fax 01782 522240

ASD METAL SERVICES – DURHAM
Drum Road, Drum Industrial Estate,
Chester-le-Street, Co. Durham DH2 1ST
Tel 0191 492 2322 Fax 0191 410 0126

ASD METAL SERVICES – CARDIFF
East Moors Road, Cardiff CF1 5SP
Tel 029 2046 0622 Fax 029 2049 0105

ASD METAL SERVICES – STALBRIDGE
Station Rd, Stalbridge, Dorset DT10 2RW
Tel 01963 362646 Fax 01963 363260

ASD METAL SERVICES – NORFOLK
Hamlin Way, Kings Lynn, Norfolk PE30 4LQ
Tel 01553 761431 Fax 01553 692394

ASD METAL SERVICES – EXETER
Sidmouth Road, Clyst St Mary, Exeter EX5 1AD
Tel 01395 233366 Fax 01395 233367

ASD METAL SERVICES – DAVENTRY
Royal Oak Ind. Est., Daventry, Northants NN11 5QQ
Tel 01327 876021 Fax 01327 87612

ASD METAL SERVICES – TIVIDALE
Tipton Road, Tividale, Oldbury, West Midlands B69 3HU
Tel 0121 520 1231 Fax 0121 520 5664

AUSTIN TRUMANNS STEEL LTD
Brightgate House, Cobra Court,
Trafford Park, Manchester M32 0TB
Tel 0161 866 0266 Fax 0161 866 0291

BARRETT STEEL SERVICES LTD
Barrett House, Cutler Heights Lane,
Dudley Hill, Bradford BD4 9HU
Tel 01274 682281 Fax 01274 651205

CELTIC STEEL SERVICES
Caerphilly Road, Ystrad Mynach, Mid Glamorgan CF82 6EP
Tel 01443 812181 Fax 01443 812558

CORUS BELLSHILL
Mossend Engineering Works, Unthank Road, Bellshill,
North Lanarkshire ML4 1DJ
Tel. 01698 748424. Fax 01698 747191

CORUS BLACKBURN
Unit 5, Walker Road, Blackamoor Road,
Guide, Blackburn BB1 2QE
Tel 01254 55161 Fax 01254 670836

CORUS BRISTOL
Badminton Rd Trading Est., Yate,Bristol BS37 5JU
Tel 01454 315314 Fax 01454 325181

CORUS DARTFORD
Farnigham Road Station, South Darenth, nr Dartford DA4 9LD
Tel 01322 227272 Fax 01322 864893

CORUS IRELAND
Hulls Hill, Lisburn,Co. Antrim BT28 2SN
Tel 028 9266 0747 Fax 028 9266 0748

CORUS NEWCASTLE
Chainbridge Road Industrial Estate,
Blaydon-on-Tyne, Tyne & Wear NE21 5SS
Tel 0191 414 2121 Fax 0191 414 2210

CORUS SERVICE CENTRE
Steel House, Bluebell Avenue, Bluebell Industrial Estate,
Dublin 12, Republic of Ireland
Tel 00 353 1 405 0300 Fax 00 353 1 405 0330

CORUS STOURTON
Wakefield Rd, Stourton, Leeds LS10 1AY
Tel 0113 276 0660 Fax 0113 272 4418

CORUS WEDNESFIELD
The Steelpark, Steelpark Way, Wednesfield,
Wolverhampton WV11 3BR
Tel 01902 484000 Fax 01902 484288

INTERPIPE UK LTD
14-16 High Street, Ironbridge, Shropshire TF8 7AD
Tel: 0845 226 7007 Fax: 01952 434017

LASERTUBE CUTTING
Unit 8, Autobase Industrial Estate, Tipton Road,
Tividale, West Midlands B69 3HU
Tel 0121 601 5000 Fax 0121 601 5001

NATIONAL TUBE STOCKHOLDERS LTD
Dalton Industrial Estate, Dalton,
Thirsk, North Yorkshire YO7 3HE
Tel 01845 577440 Fax 01845 577165

JOHN PARKER & SONS LTD
Vauxhall Road, Canterbury, Kent CT1 1HD
Tel 01227 783200 Fax 01227 783417

PORTWAY STEEL SERVICES
The Stables, Brook Farm, Westerleigh, Bristol BS37 8QH
Tel 01454 311442 Fax 01454 311445

RAINHAM STEEL CO LTD
Kathryn House, Manor Way, Rainham, Essex RM13 8RE
Tel 01708 522311 Fax 01708 559024

SOUTH PARK STEEL SERVICES
Thomson House, Faraday Street
Birchwood Park, Warrington WA3 6GA
Tel 01925 817000 Fax 01925 818844

SOUTH PARK STEEL SERVICES
South Park Road, South Park Industrial Estate,
Scunthorpe DN17 2BY
Tel 01724 810810 Fax 01724 810081

STEELSTOCK (BURTON ON TRENT) LTD
Ryder Close, Cadley Hill Road,
Swadlincote, Derbyshire DE11 9EU
Tel 01283 226161 Fax 01283 550406

STRUTHERS & CARTER LTD
Erimus Works, Valletta Street, Hedon Road, Hull HU9 5NU
Tel 01482 795171 Fax 01482 786186

STRUCTURAL FASTENERS

ANDREWS FASTENERS LTD
Latchmore Park, Latchmore Road, Leeds LS12 6DN
Tel 0113 246 9992 Fax 0113 243 6463

BAPP GROUP LTD
Unit 15, Darton Business Park, Darton,
Barnsley, South Yorkshire S75 5NQ
Tel 01226 383824 Fax 01226 390004

COOPER & TURNER LTD
Sheffield Road, Sheffield S9 1RS
Tel 0114 256 0057 Fax 0114 244 5529

GWS ENGINEERING & INDUSTRIAL SUPPLIES LTD
Link Road, Poulavone, Ballincollig,
Co Cork, Republic of Ireland
Tel 00 353 21 4875 878 Fax 00 353 21 4875 882

LINDAPTER INTERNATIONAL
Lindsay House, Brackenbeck Road, Bradford BD7 2NF
Tel 01274 521444 Fax 01274 521130

PROFAST (GROUP) LTD
Unit 10-11 Western Industrial Estate,
Naas Road, Dublin 12, Republic of Ireland
Tel: 00 353 (0) 1 456 6666 Fax: 00 353 (0) 1 450 0198

TENSION CONTROL BOLTS LTD
Whitchurch Business Park, Shakespeare Way,
Whitchurch, Shropshire SY13 1LJ
Tel 01948 667700 Fax 01948 667744

CORPORATE MEMBERS

BALFOUR BEATTY UTILITY SOLUTIONS LTD
Tel 01332 661491

GRIFFITHS & ARMOUR
Tel 0151 236 5656

HIGHWAYS AGENCY
Tel 08457 504030

ROGER POPE ASSOCIATES
Tel 01752 263636

SCI Members

The Steel Construction Institute develops and promotes the effective use of steel in construction. It is an independent, membership-based organisation. Membership is drawn from all sectors of the construction industry; this provides beneficial contacts both within the UK and internationally. Its corporate members enjoy access to unique expertise and free practical advice which contributes to their own efficiency and profitability. They also recieve an initial free copy of most SCI publications, and discounts on subsequent copies and on courses. Its multi-disciplinary staff of 45 skilled engineers and architects is available to provide technical advice to members on steel construction in the following areas:

- Technical Support for Architects
- Bridge Engineering
- Building Interfaces
- Civil Engineering
- Codes and Standards
- Composite Construction
- Connections
- Construction Practice
- Corrosion Protection
- Fabrication
- Health & Safety — best practice
- Information Technology
- Fire Engineering
- Light Steel and Modular Construction
- Offshore Hazard Engineering
- Offshore Structural Design
- Piling and Foundations
- Specialist Analysis
- Stainless Steel
- Steelwork Design
- Sustainability
- Vibration

Details of SCI Membership and services are available from:
Sandi Gentle, Membership Manager, The Steel Construction Institute, Silwood Park, Ascot, Berks.
Telephone: +44 (0) 1344 636509 Fax: +44 (0) 1344 636570
Email: s.gentle@steel-sci.com Website: www.steel-sci.com

All full members of the BCSA are automatically members of the SCI. Their contact details are listed on the BCSA Members pages

CORPORATE MEMBERS

3E Consulting Engineers Ltd
A C Bacon Engineering Ltd
A Dawber Limited
A Steadman & Son Ltd
Aberdeenshire Council
Absolute Consulting Engineers
ACE (Leicester)
AceCad Software Ltd
ACL Structures Ltd
Active Design
Adams Kara Taylor Ltd
Adey Steel Ltd
ADP Consulting Engineers Ltd
Adstone Construction Ltd
Advanced Fabrications Poyle Ltd
Air Products Plc
Aker Process Ltd
AKSWard
Alan Baxter & Associates
Alan Conisbee & Associates
Alan Dorman Consulting Engineer
Alan Johnston Partnership
Albion Sections Ltd
Alcock Lees Partnership
Allerton Engineering Ltd
Allslade Plc
AMEC NNC Limited
AMP Consultants
Andrew Dust Structural Engineers
Andrew Howard & Partners
Apex Steel Structures Ltd
Architectural Profiles Ltd
Arromax Structures Ltd
Arrow Structural Framing Sales Ltd
Arup
Arup Associates
ASA Steel Structures Ltd
ASD Westok Ltd
Asme Engineering Ltd
Associated Structural Design
Atkins
Atkins MSL Engineering Ltd
Atlas Ward Structures Ltd
Atlasco Constructional Engineers Ltd
AWF Steel Ltd
Ayrshire Metal Products Plc

B D Structures Ltd
B W Industries Ltd
BAA Capital Projects
Balfour Beatty Rail Projects Ltd
Ballykine Structural Engineers Ltd
BAM Construct UK Ltd
BAM Nuttall Ltd
Barrett Steel Buildings Ltd
Barretts of Aspley Ltd
Baxter Glaysher Consulting
BDO Offsite
BDS Steel Detailers
Bechtel Ltd
Benaim
Bentley Systems
Beresford Dunne Consultants Ltd
Bestech Systems Ltd
BHC Ltd
Billington Structures Ltd
Birmingham City Council
Black & Veatch Ltd
Blyth & Blyth Consulting
Bodycote Metallurgical Coatings
Bolton Priestley
Bone Steel Ltd
Border Steelwork Structures Ltd
Bourne Construction Engineering Ltd
Bridgetown Developments Ltd
British Constructional Steelwork Association Ltd
British Energy Plc
British Nuclear Group
British Stainless Steel Association
Briton Fabricators Ltd
Browne Structures Ltd
Brunner Mond UK Ltd
BSB Structural Ltd
Building & Structural Consultants
Bunyan Meyer & Partners Ltd
Buro Happold
Burroughs Stewart Associates
Butterley Ltd
BWB Consulting Ltd

C.S.C. Engineers Ltd
CADS (Computer & Design Services Ltd)
Cairnhill Structures Ltd
Caledonian Building Systems
Cameron Taylor
CampbellReith
Capita Bobrowski
Capita Gwent Consultancy Ltd
Cardiff County Council
Cardiff University
Carnaby Steel Structures
Carter Design Group
Cass Hayward LLP
Caunton Engineering Ltd
CB&I UK Limited
CEL International Ltd
Cheshire County Council
Chieftain Contracts Ltd
CIRIA
City University
Civil & Structural Computer Services Ltd
Clarke Bond Group Limited
Clarke Nicholls & Marcel
Clarkslegal LLP
Clegg Associates
Cleveland Bridge UK Ltd
CMF Limited
Compass Engineering Ltd
Complete Design Partnership Ltd
Composite Design Ireland LLP
Conder Structures Ltd
Construction Design Solutions
Cordell Group Ltd
Cornwall County Council
Corus
Corus Rail
Coventry Construction Ltd
Coventry University
Crown Structural Engineering Ltd
CSC (UK) Ltd
Cundall
Curtins Consulting
CWT Partnership

D H Structures Ltd
Dalton Consultants
Defence Estates
Devon County Council
Devonport Management Ltd
Discain Project Services Ltd
Dorman Long Technology Ltd
Doyle Partnership
Dundee City Council

Elland Steel Structures Ltd
Elliott Wood Partnership LLP
Elsome Structures Ltd
Emile Sanan
Emmett Fabrications Ltd
Engineered Off-Site Systems Ltd
Engineering & More Ltd
Engineering Solutions Partnership
Eurobond Laminates Ltd
Evadx Ltd
Evans & Langford LLP
Expedition Engineering Limited

F J Booth & Partners Ltd
F J Samuely & Partners Ltd
Faber Maunsell
Fabsec Ltd
Fairfield-Mabey Ltd
Fisher Engineering Ltd
Flint & Neill Partnership
Fluid Structural Engineers
Fluor Ltd
Foggo Associates Ltd
Forbes King
Fothergill
Fox Bros Engineering Ltd
Framing Solutions plc
Frank H Dale Ltd

Galvanizers Association
Gardenwood Ltd
Gary Gabriel Associates
George Mathieson Associates
Gibbs Engineering Ltd
Gibson Design Consultancy Ltd
Gifford
Gifford Ltd
Glasgow Caledonian University
Glentworth Fabrications Ltd
GME Structures Ltd
Goodwin Steel Castings Ltd
Gordon S Muir Civil & Structural Eng. Design
Gorge Fabrications Ltd
Graham A Reeve Associates Ltd
Graham Wood Structural Ltd
Grays Engineering (Contracts) Ltd
Gregg & Patterson (Engineers) Ltd
Grontmij

H Young Structures Ltd
Had-Fab Limited
Halcrow Group Ltd
Halcrow Yolles
Hallmason Design Ltd
Hambleton Steel Ltd
Hanson Building Products Ltd
Harold Newsome Ltd
Harry Marsh (Engineers) Ltd
Harry Peers Steelwork Limited
Henrob Limited
Henry Smith (CE) Ltd
Henry Venables Products Ltd
Hescott Engineering Company Ltd
Highcliffe Court Design Limited
High-Point Rendel
Highways Agency
Hill Cannon (UK) LLP
Hills of Shoeburyness Ltd
Hi-Span Ltd
Hockley & Dawson Consulting Engineers Ltd
Holywell Structural Design
HOP Consulting Ltd
HSP Consulting
Hurst Peirce & Malcolm LLP

Impaq Ltd
Imperial College London
Institution of Structural Engineers (IStructE)
Integer Software Limited
Integrated Environmental Solutions Ltd

J Robertson & Co Ltd
Jacobs Babtie
Jacobs Engineering UK
Jacobs Engineering UK Ltd
Jacobs UK Ltd
James Bros (Hamworthy) Ltd
James Killelea & Co Ltd
James Lupton Consultants
Jenkins & Potter Ltd
John Reid & Sons (Strucsteel) Ltd
JPG (Holdings) Ltd

K K Consultancy Ltd
KB2
Keith Kendal Consultants
Kellogg Brown & Root Ltd
Kier Engineering Services
Kingspan Limited
Kingspan Offsite
Kingspan Offsite - Profiles & Sections
Kingspan Off-Site Ltd
Kingston University

LA Elwell Ltd
Leach Structural Steelwork Ltd
Leighs Paints
Lindapter International
London Borough of Hillingdon
Lowe Engineering (Midland) Ltd

M & S Engineering Ltd
M Hasson & Sons Ltd
Mace Ltd
Magna Buildings Ltd
Maslen Brennan Henshaw
Mason Navarro Pledge Ltd
Mech Tool Engineering Ltd
Melliss LLP
Metals Industry Skills & Performance (MetSkill)

Metek UK Ltd
Metsec Plc
Michael Barclay Partnership
Midland Steel Structures Ltd
Midland Structural Services Ltd
Mifflin Construction Ltd
Mike Curnow
MJM Consulting Engineers Ltd
MLM Maddocks Lusher & Matthews
Morgan Est
Mott MacDonald
MPN (UK) Ltd
MSW (UK) Ltd

Napier University
Newbridge Engineering Ltd
Newton Fabrications Ltd
Norder Design Associates Limited
Nottingham Trent University
NPS North East Ltd
Nusteel Structures Ltd
Nuttall John Martin
NW Structural Consultants Limited

On Site Services (Gravesend) Ltd
Overdale Construction Services Ltd
Owen Williams Consultants
Oxford Brookes University

Parsons Brinckerhoff Ltd
Patrick Ryan Associates Ltd.
Pencro Structural Engineering Ltd
PEP Civil & Structures Ltd
Peter Brett Associates
Peter Marshall (Fire Escapes) Ltd
Peter Taylor & Partners Ltd
Pick Everard
Plandescil Ltd
PMS Fabrications Ltd
Portakabin Ltd
Powerwall Systems Limited
Price & Myers Consulting Engineers LLP
Ramboll Whitbybird
PRP:
Pyper McLarnon Partnership

Queen's University Belfast

R G Parkins & Partners Ltd
R S Mann
RAM International (Europe) Ltd
Ramage Young Limited
Ramboll Whitbybird
Remnant Engineering Ltd
Renfrewshire Council
Richard Lees Steel Decking Ltd
Richard Wood Engineering Ltd
Rigby & Partners
Rippin Ltd
Rivergate Consultants Ltd
RMJM Scotland Ltd
Robert Bird & Partners
Robert Tucker Associates
Roberts Engineering
Robinson Construction
Roger Bullivant Ltd
Rowecord Engineering Ltd
Rowen Structures Ltd
Royal Haskoning
Royal School of Military Engineering
RPS Burks Green
RPS Consulting Engineers
RSL (South West) Ltd
Ruukki UK Ltd

S H Structures Ltd
Schoeck Ltd
Scott White & Hookins
Scott Wilson Ltd
Sellafield Ltd
Selwyn Construction Engineering Ltd
Severfield-Rowen PLC
Shell UK Exploration & Production
Shipley Fabrications Ltd
Sinclair Knight Merz
Sir Robert McAlpine
Skanska Technology
Skidmore, Owings & Merrill Inc
Snashall Steel Fabrications
South Durham Structures Ltd
South Lincs Consulting Ltd
Steel Design Solutions Limited
Stephen Johnson Consulting Engineers Ltd
Stewart & Harris
Stirling Maynard & Partners
Structural Design Associates
Structural Design Partnership
Structural Metal Decks Ltd
Structural Sections Ltd
Structural Solutions
Surrey County Council

T W P
Taylor Lane Timber Frame Ltd
Teague & Sally Limited
Techniker Ltd
Tekla (UK) Ltd
Tension Control Bolts Ltd
Terence McCormack Ltd
Terrapin Ltd
The AA Group Ltd
The Angle Ring Company Ltd
The Brazier Holt Partnership Ltd
The Steel People Ltd
Thomas Morgan & Associates
Thomasons LLP
Tony Gee and Partners LLP
TPS Consult Ltd
Traditional Structures Ltd
TRP Consulting Ltd

University of Aberdeen
University of Bath
University of Birmingham
University of Bolton
University of Dundee
University of East London
University of Edinburgh
University of Greenwich
University of Leeds
University of Liverpool
University of Manchester
University of Newcastle
University of Nottingham
University of Plymouth
University of Portsmouth
University of Salford
University of Sheffield
University of Southampton
University of Surrey
University of the West of England
University of the West of Scotland
University of Wales Swansea
University of Warwick

V-Consult Limited
Vertex Systems

W A Fairhurst & Partners
W F Brown Associates Ltd
W. S. Britland & Co Ltd
Wakefield MDC Building Control
Walter Watson Ltd
Waterman Environmental
Waterman Group
Waterman International
Watson Steel Structures Ltd
WCJ Engineers
Wessex Structural Services Ltd
Westbury Park Engineering Ltd
White Young Green Consulting Ltd
WIG Engineering Ltd
Wike Steel Ltd
William Haley Engineering Ltd
William Hare Ltd
William J Marshall & Partners
Wright Associates
WSP Group

ORGANISATIONS WITH MEMBER SERVICE AGREEMENTS WITH THE SCI

Highways Agency
The Institution of Structural Engineers

INTERNATIONAL CORPORATE MEMBERS

Australia
Australian Steel Institute
BlueScope Steel Research
Cocciardi Pty Ltd
Corus Australia
Greentram Software Pty Ltd

Belgium
Staalinfocentrum - Centre Information Acier
World Steel Association

Brazil
CBCA - Brazilian Center of Steel Construction
CODEME Engenharia S.A.
Federal University of Minas Gerais
Gerdau Açominas S/A
USIMINAS

Canada
Canadian Institute of Steel Construction

Croatia
Institut Gradevinarstva Hrvatske d.d.

Finland
Hamk University of Applied Sciences
Rautaruukki Oyj
Ruukki Construction
Seinajoki Polytechnic
VTT Technical Research Centre of Finland

France
CTICM
TERRELL

Germany
Bauen mit Stahl e.V.

Greece
Computer Control Systems SA
Democritus University of Thrace
Elias Chalvantzis
K Liaromatis S.A.
Maraveas & Associates SA
NSH
Technical Chamber of Greece (TEE)

Hong Kong
The Hong Kong Polytechnic University

Hungary
Lindab Building Systems

Ireland
Andrew Mannion Engineering Ltd
Barrett Mahony Consulting Engineers Ltd
Bechtel Overseas Corporation
C. S. Pringle Ltd
CBA Consulting Engineers
Coyle Kennedy Ltd
Cronin Buckley
DBFL Consulting Engineers Ltd
Denis O'Sullivan & Associates
Downes Associates
Duggan Profiles & Steel Service Centre Ltd
Duggan Steel
ESB International Ltd
Frank Fox & Associates
Fusion Building Systems
Hayes Higgins Partnership
Institute for Steel Development & Growth (INSDAG)
J B Barry & Partners Limited
Joda Engineering Consultants
Kilgallen & Partners Consulting Eng Ltd
Leonard Engineering (Ballybay) Ltd
Metcon
Michael Punch & Partners
Milltown Engineering Ltd
National University of Ireland, Galway
Newell Roofing Products
O'Connor Sutton Cronin
Oliver Russell & Associates Ltd
Pinnacle Consulting Engineers Ltd
Project Management Ltd
Project Management Ltd
R G Parkins & Partners Ltd
Royal Haskoning
RPS Consulting Engineers Ltd
Scott Wilson Ltd
SIAC Butlers Steel Ltd
Steel & Roofing Systems Ltd
T J O'Connor & Associates
The McKenna Pearce Practice
TOBIN Consulting Engineers
Walsh Associates
Walsh Draughting Services Ltd

Italy
Politecnico Di Milano
Universita Degli Studi Di Trento

Jersey
D J Hartigan & Associates Ltd

Kenya
David Engineering Ltd
Mabati Rolling Mills Ltd

Liechtenstein
HILTI AG

Lithuania
Vilnius Gediminas Technical University

Luxemborg
Lindab-Astron Group

Malaysia
Inotek Prima Sdn Bhd
Universiti Kebangsaan Malaysia (UKM)
Universiti Teknologi Malaysia
TBA Periti

New Zealand
HERA
NNN Ltd

Norway
Tee Consult Holding AS

Poland
Project Management Ltd

Portugal
Universidade de Aveiro
Universidade de Coimbra - Polo II

Qatar
Metalex Trading & Contracting Co. W.L.L

Republic of Singapore
Jurong Engineering Ltd
LSW Consulting Engineers
Ngee Ann Polytechnic
Singapore Structural Steel Society

Russia
Steel Construction LLC

South Africa
J W Swallow & Associates
Southern African Institute of Steel Construction
Tricom Structures

South Korea
Hyundai Steel Company
POSCO

Spain
In Hoc Signo Vinces S.L.
ITEA - Instituto Tecnico de la Estructura en Acero
University of Navarra

Sweden
Swedish Institute of Steel Construction

The Netherlands
Bouwen met Staal
Delft University of Technology

Turkey
Almetsan
CIMTAS Celik Imalat Montaj Ve Tesisat A.S.
UMO Architecture Engineering & Consulting Ltd Co

United Arab Emirates
Emirates Building Systems LLC
Future Vision Steel Construction Contg.LLC
GINCO Steel L.L.C.
Techno Steel Construction Co
WSP Middle East Ltd

USA
American Iron & Steel Institute
Epic Metals Corporation
Steel Recycling Institute

Metfloor®

MetFloor® has amazing spanning performance


MetFloor® 55


MetFloor® 60


MetFloor® 80

Simply one of the best performing
composite metal floordeck ranges in the UK

Tel 01495 761080 www.cmf.uk.com

CMF® Composite Metal Flooring